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LECTURE.

THE HEATING AND VENTILATION OF THE MANSFIELD SCHOOLS AND CHURCHES.

A Lecture delivered before the Mansfield Lyceum, February 13, 1889.

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There are three leading combinations of chemicals that enter essentially into the welfare of the human economy, the absence of either one of which would soon result in death. The adulteration or impurity of either, or a reduction of the normal supply of either one, results in a proportionate injury to the living human organism.

These three combinations are air, water, and food. In previous papers read before this Lyceum and our City Council I have called attention to the importance of a bountiful supply of pure water, and our city authorities have practically demonstrated their appreciation of such a supply by investing the sum of $190,000 in securing a suitable water supply for our city, which requires an annual outlay of $5,700 to maintain, saying nothing of the interest on the capital invested in the plant, and yet no one complains, or would ever think of voting to abolish our city water works, which every person concedes to be an absolute necessity.

The importance of a bountiful supply of pure air is second to neither of the other two combinations that must needs be present in order to support human life, and from personal experience and repeated investigations the unwarranted neglect and miserly supply of this, the freest of all of nature's gifts to man, has led me, as your City Health Officer, to inspect the schools and churches of our city, and give you an unvarnished report of their real condition as to heating and ventilation.

In warm countries, where there is little need of protection from the elements, and where open huts serve in place of the "hermetically sealed" houses in our more rigorous Northern climates, there is little need of systems of heating and ventilation, for there the native or his visitor gets a bountiful supply of God's free pure air night and day, winter and summer, unmolested by the conventionalities of art. Not so in our Northern climates. The open hut is replaced by the device of the city architect, who at once commences to rob our people of their pure air, and study how they can build all sorts of fancy structures of the latest and most approved style, in which they can "hermetically seal" their inmates from the oceans of pure air that surround this "human can they call a house," and thus not only starve them of oxygen, but poison them in their own excrement—the carbonic acid gas they exhale from their stinted lungs at every breath. Could the dead that lie in yonder grave-yard, who have fallen victims to illy planned and improperly heated and ventilated dwellings, lift their voices in one accord against the architects who by their mistakes have forced them to a premature grave, nothing but an Ashland County jury would save them from conviction of murder in the second degree.

In making these inspections I have endeavored to "hew to the line, let the chips fall where they may." I have inspected all the churches, and each room in every school-house in the city, in person, and noted the exact plan by which it is heated and supplied with pure air, or air of any kind, and have tried to briefly point out their faults and also note their good qualities, and will close the paper by giving you a simple, yet scientific method, illustrated by charts and practically demonstrated by a model, whereby you can heat your buildings thoroughly, and at the same time flood them with abundance of pure air.

Before giving the details of these inspections, it is only just that I should say that in the main the people are not to blame for the almost universal defects found in the heating and ventilation of their schools and churches. They are not expected to know, nor to study up those problems, and most naturally depend on the architects for all the plans and specifications regarding their buildings, and hence they are just the persons the sanitarians are looking for, and *to* whom and *of* whom they have a word to say. The architect comes to you with a beautiful perspective, every inch of which is elaborately detailed down to the tacks and paint. So much must be stone from

Cleveland, Cincinnati, or New Hampshire; so much must be brick of the latest pattern, burned with *hickory wood*; this particular part of the edifice must be finished with boards cut from the cedars of Lebanon, that part must be furnished with choice butternut from the valleys of the Mohican, the windows must be dappled with glass of many colors, the walls ceiled in with the best of plaster, and furnished with a specially hard finish; the floors must be of the finest oak, inlaid with hard woods of many kinds and colors; and finally this great and costly mansion is to be heated according to the latest and most approved methods.

That is usually all that is said and about all that is done in regard to supplying you and your family with the real necessity of life—the most important part of the whole edifice. I mean to say that the average architect pays little or no attention to the heating and ventilation of your building. He can tell you all about the ornaments and fancy fixings on the cupolas and cornices of your house, and will insist that they be mathematically correct, yet the heating and ventilation, on which depend your life and health, he leaves to some furnace peddlar to complete "in the latest and most approved manner."

Go with me now, if you please, for a few moments, while I take you from church to church, and school-house to school-house of our prosperous city, and examine into and study from a practical and scientific standpoint the legacy the architects have left this city in the way of heating and ventilation in a class of buildings that should be the pride of every city and above all other public buildings the very type of perfection.

On December 18, 1888, I visited and examined the St. Luke's Lutheran church, which is not yet completed, and which was planned by an eminent architect, Mr. Wm. Gibbon Presto, of Boston, Mass. I found the church was heated by two Ætna soft-coal furnaces, made at Springfield, O., which are supplied with cold air from two windows leading into the coal rooms in the basement, over which the air must pass before entering the heater. The lecture-room of the church is heated from these furnaces by hot air, which is conveyed in conduits coming in from 4 to 7 feet from the floor. At the rear end of the lecture room is a fire-place, and just beside it a foul-air register near the floor and opening into the furnace at that end of the church. At the front, or pulpit end of the lecture-room are foul-air ventilators located about 3 feet from the floor and opening into conduits that pass through pillars near the pulpit in the auditorium and open into the garret, which connects with the open tower. The one of these passes a part of the distance near the furnace, which aids some in warming its contents of foul air, and thus assists in its upward movement, while the other is not provided with any means of heating whatever. In the auditorium the warm air comes in at the floor, while the foul air is allowed to escape by means of registers placed about 3 feet above the floor and opening into the attic, with no provisions for heating the column of cold air and thus favoring the exhaustion of the foul air from the main room.

REMARKS.—With no provisions for protecting the pure air from the dust of the coal and the ashes of the furnace it begins to get fouled before it enters even the hot-air chamber of the heater, and is an excellent method to carry quantities of dust into the rooms to be heated and ventilated. Whilst the lecture-room receives a pressure of warm air from the furnace the fire-place in the rear end of the church furnishes a most excellent method for the escape of the stratum of cold foul air that always finds a place at the floor, and it should always be kept burning when the room is being occupied. The foul-air ventilator that opens into the furnace should never be left open after the room is once heated, and under no circumstances when occupied by an audience, as that only serves to convey the *cold foul* air back to the furnace to be reheated and returned in all its impurity to be breathed over again by the audience. The other foul-air registers should have been placed at the floor, instead of 3 feet above the floor, and supplied with means for heating the column of cold air contained in them. As it is, they leave a three-foot stratum of cold foul air in the rooms they are intended to ventilate, even when the ventilators work. But you must remember they will not work until there is a sufficient pressure of air from within to lift the cold column of air they contain, and if that is at any time greater than the pressure within, they will allow their contents to descend into the room to the discomfort of the audience.

In the lecture-room, however, the fire-place when in use serves this purpose as far as it goes, and not unfrequently creates such a draft as to cause the cold air to descend in the foul-air ventilators to supply and equalize the vacuum thus induced, especially when the supply from the furnace does not equal the amount of air exhausted by the fire-place. It must be remembered that a grate with a fire in it, and foul-air flues without fire, will not work harmoniously in the same room at the same time; hence one or the other, as a rule, should be closed.

On December 26, 1888, I examined the Baptist church, which was built in 1864, but by whom it was planned I was unable to learn at this time. I found it was heated by a Ruby soft-coal furnace, which was supplied by fresh air from the outside by two 8x8 inch cold-air conduits, whilst the warm air was admitted into the auditorium by five registers placed in the floor near the rear end of the room, to which the warm air was conveyed by five 10-inch hot-air conduits. Two foul-air registers were placed in the floor near the front

end of the auditorium, one on either side, and connected with a conduit that returned the cold foul air to the furnace to be reheated and returned to the room again. These, however, had been abandoned some time since and closed up. Two 14x16 inch registers were placed in the ceiling, which allows all the warm pure air to escape into the garret, while the cold foul air is allowed to remain in the lower portion of the room. The janitor, however, has discovered that in order to heat and keep the auditorium warm he must close these registers, which serve him well when the room gets too warm and he desires to cool it off rapidly.

REMARKS.—By enlarging the cold-air inlet of the furnace, and opening the foul-air ventilators at the floor into the two chimneys at the front end of the church, which are always kept warm by stoves, a very great improvement could be had at a minimum amount of expense in the way of heating and ventilating the auditorium. The lecture-room is heated by stoves, with no provision for either the ingress of pure air or egress of foul air, except by the windows, which needs no comment at this day and age, as a means of ventilation, as they are always an objectionable means of obtaining fresh air, except in very warm weather.

On January 10th and 11th, 1889, I inspected the Congregational church, which was built during 1871–3, at a cost of nearly $125,000, under the direction of architect G. P. Randall, of Chicago, Ill. The auditorium is heated by steam from coils of pipe running under each seat, which furnish ample means for the desired amount of heat. The original plan provided for seven large ventilators placed in the comb of the roof and leading down into the top of the auditorium, and so arranged by valves as to be opened or closed at will, whilst the foul air was expected to beat a hasty retreat through two small registers, 12x12 inches, placed in the base-board of the auditorium and opening into the cellar.

By this theoretical plan it was intended to let the fresh air in at the comb, which being cold and consequently heavier, would descend into the auditorium, driving the foul air out at the floor into the cellar. But, like the old spook story of our childhood, when a certain boy undertook to scare another lad while he was passing through a certain piece of timber land, it was a failure. Having secured a sheet he placed it over his head and lay in wait for his victim. But a pet monkey decided to imitate the performance, and, unseen, followed his master to his hiding place, with a pillow-case over *his* head. Just as the victim approached, the trickster chanced to spy spook No. 2, and instead of scaring his victim, became frightened himself, and started to run with all his might, followed by the monkey, while the victim enjoyed the fun and egged on the race by shouting, "Run, big spook, or little spook will catch you."

So in this method of ventilation, instead of the fresh air coming in at the comb and supplying the auditorium, the warm air rushed out, and instead of the foul air passing out through the little registers at the base-board, the cellar air rushed in, and we had a reverse order of affairs throughout, as in the old spook story. These are only the result of natural laws, however. The warm air being lighter rises and escapes through the comb ventilators, there being no provision made by the architect for a supply of fresh air a vacuum is the result, and the equilibrium is established by the cold air rushing in from the cellar through the foul-air registers, as well as through the doors and windows. The janitor, however, found it impossible to heat this room with the comb ventilators open, and in order to accomplish his duties satisfactorily, closed them and supplied the auditorium with fresh air by means of doors and windows.

The lecture-room of this same church is heated by stoves, and has no supply of fresh air, except through the doors and windows, whilst the warm air is allowed to escape, as usual, at ventilators placed near the ceiling, and the foul cold air is allowed to remain at the floor for the benefit and edification of the audience.

REMARKS.—It is no doubt plain to every one here to-night that the heating and ventilation of this church is a practical failure. It is true you heat the church, and, as managed by the janitor, you get some fresh air from promiscuous sources, and allow a part of the foul air to escape, none of which can be credited to the original plan, which in and of itself cannot be recommended as a desirable method of heating and ventilating.

On January 15th, 1889, the First Presbyterian church was inspected; it was built in 1858, but by whom I am unable to inform you. This church is heated by two Montrose hard-coal furnaces, which are supplied with a small quantity of fresh air from the outside, but the mechanism of the furnace is such that the air is frequently contaminated with gas and dust, and always so overheated as to make it very disagreeable to inhale. The provisions for ventilating the auditorium are a few small ventilators, placed near the ceiling, which permit a quantity of the warm air to escape and leaves the carbonic acid near the floor to soothe the innocent audience to sleep while they may be trying to listen to the most interesting sermon. Hence the objectionable method of window ventilation must be resorted to as the less of two evils, to relieve the so-called "closeness of the air" and stupor of the audience from the poisonous effects of large quantities of carbon dioxide. The lecture-room is heated by direct radiation from the same heaters, and has no system of ventilation, except the windows and doors.

REMARKS.—In this case it is plain that the church is improperly heated and is devoid of anything like adequate ventilation, whilst large quantities of coal are wasted annually in trying to make the church approximately comfortable.

The St. John's German Evangelical church was visited and inspected January 18, 1888. This edifice was built in 1870, and is heated by a Barnes' soft-coal heater, No. 64, which secures its supply of air from the Sunday-school room, which it heats by radiation, and this air, after being vitiated by the Sunday-school scholars, is heated and conveyed to the auditorium in a second-hand condition for the congregation to use during the sermon. No provisions are made for ventilation except by windows in either the auditorium or Sunday-school room.

On the same date I visited the St. Peter's Catholic church, a handsome edifice, built in 1870; this is heated by stoves, and has no provisions for ventilation except the doors and windows.

REMARKS.—The congregation is a large one, and the architectural finish of the interior of the church is very costly as well as attractive, but the supply of pure air for the hundreds who congregate there from day to day has been wholly left out of consideration except by the faulty method of window ventilation.

On the 21st of January, 1889, I visited the Episcopalian church, which was built in 1847, and has had some repairs since that time. It is heated by one Crystal furnace, manufactured at Troy, N. Y., and one Sayer furnace, made at Montrose, Pa. The former takes its cold air from the cellar, which is in quite a dilapidated condition, and is in turn supplied by a hole in the wall on the west side of the church. The Sayer furnace is supplied with cold *foul* air from the rear of the auditorium, whilst the pure air from outside is carefully avoided, except so much as may steal into the foul air register from the outside door of the church. There are no other provisions for ventilation except the doors and windows. The Sunday-school room, built two or three years ago, is heated by stoves, and ventilated by the door and window system.

REMARKS.—In the one furnace the impurities of an old and musty cellar are conveyed with the air to the furnace, heated, and forwarded to the auditorium, while the other furnace is employed to reheat the foul cold air of the church and return it to the unsuspecting audience to be breathed over and over again during each service.

The same day I inspected the United Presbyterian church, which was built in 1885, and planned by Richard Vaux, of New York City.

It is a handsome, well-arranged edifice, heated by two hard-coal "Richmond Triumph" furnaces, Nos. 30 and 27, built at Norwich, Conn. More care than usual has been observed with these furnaces, to exclude all the pure outside air possible, and instead the one is supplied with cold foul air exclusively, taken from the auditorium, reheated, and returned to the audience, while the other is supplied with air from the hall leading off the main hall to the lecture and Sunday-school rooms. Owing to the necessity of having the front door open as the people come and go, a small supply of outside air finds its way to this furnace at the opening and closing of each service.

REMARKS.—By means of openings in the ceiling and the opening of windows at the top, they are enabled to retain a large quantity of the cold foul air near the floor, and allow a great and unnecessary waste of the warm pure air through these openings. If the church authorities would close all the top openings of their rooms, keep them closed except when they desire to cool their church, supply the furnaces with fresh pure air from the outside, empty their foul cold-air into the ventilating flue instead of heating and returning it to be breathed over again, they would find a reduction in their coal bills, and a large decrease in the drowsiness of their congregation when confined for any length of time in the auditorium.

On January 21, 1889, I examined into the heating and ventilation of the Methodist Episcopal church, which was built by Mr. Hershiser, of this city, about 1868. It is heated by two hard-coal furnaces. One is a No. 5 Sayer furnace, built at Montrose, Pa., and the other is without name, so far as I could see, but is much like the Sayer heater. The former is placed in the library, and when the library window is open, it is supplied with fresh air from the exterior of the building; but when the window is closed, it is without a fresh-air supply, and must draw its air from the library and lecture room with which to supply the auditorium. The other furnace is supplied with fresh air by a conduit about a foot square, which receives its supply from the outside by means of a window. There is no provision whatever for the escape of foul air from the auditorium except through the doors and windows. Two small registers have been placed at either side of the auditorium on about a level with the tops of the windows, which allow quite a quantity of the *warm pure-air* to escape, and thus aid in cooling the room and wasting the fuel. The lecture room must depend entirely on door and window ventilation for the purification of the air.

REMARKS. — By changing the registers and placing them at the floor, making them several times larger, and supplying both furnaces all the time with fresh air from the outside of the church, the auditorium could be very greatly improved with regard to its heating and ventilation.

The Christian church was examined on January 22, 1889. The erection of this church dates back to a period before the civil war; the exact date I was unable to obtain. It is heated by a

Sayer furnace No. 5, supplied from the floor of the auditorium with *cold foul-air*, which is allowed to escape through a register in the floor at the west side of the church; this connects with a cold air conduit coming from the exterior of the edifice to the furnace. No other provisions have been made for the escape of the foul cold-air except the doors and windows.

REMARKS.—In this church we have a mixing of "good and evil," as it were. So far as supplying the furnace with air from the outside is concerned it is good, but when it comes to contaminating the same with vitiated air from the auditorium, it is evil. The vitiated air should be conveyed to a ventilating flue and allowed to escape.

On January 22, 1889, I visited the Evangelical Lutheran church, which has been recently repaired. This structure is heated by two "John Grossius" soft-coal heaters, made in Cincinnati. The Sunday-school room is heated by radiation, and ventilated by doors and windows only. The auditorium is heated by fresh warm air, which enters the room by means of registers in the floor. There is no provision for the escape of foul air except by the doors and windows. An opening in the garret is in the interest of the coal dealers, as it necessitates the use of more coal to heat the church, owing to the great loss of warm air, whilst the corresponding increase of carbonic acid keeps up a slow process of poisoning the audience.

On the same day I visited the English Lutheran church, which is an old-style edifice, built in 1856, and soon to be replaced with a new one.

This building is heated with a Sunbeam Challenge furnace, from New York. The furnace is placed in the lecture room, which is heated by radiation, and ventilated by doors and windows, while the auditorium is supplied with foul air taken from the lecture room, and heated and sent upstairs. There is no provision for the escape of the foul air except through the windows and doors of the auditorium, which is supplied with a sort of a safety-valve attachment in the way of a trap door in the ceiling, which is very convenient to waste the surplus heat of the room when the pressure gets too high.

On January 22, 1889, I visited the church of the Believers in Christ, which was planned by the pastor, Rev. Sorg, and built in 1887. This plain but neat little edifice is heated by a Montrose furnace and supplied with fresh air from the exterior of the building by means of a 15-inch vitrified pipe conduit. The foul air is removed from the lecture and Sunday-school rooms and auditorium by means of four foul-air registers placed at the floor and opening into the ventilating shafts. The auditorium is also supplied with four additional registers, placed near the ceiling, which are only used to cool the church when it gets overheated.

REMARKS.—I cannot pass this building without congratulating this congregation on the advancement they have attained over all the other churches in the city, with perhaps one exception, in regard to the heating and ventilation of their building.

On January 24, 1889, I examined the Associate Presbyterian church, which is a very small edifice, built in 1888; it is heated by stoves, and ventilated by doors and windows. Four 12×12 inch registers have been placed in the walls near the ceiling, and are only mentioned to be condemned, except for cooling off the church when it is overheated.

On the same day I inspected the Reform Presbyterian church, which was planned by a Mr. Rumbaugh, then of this city, and built in 1885. This church is heated by Goff & Co.'s hard coal, hot-air, blast furnace, which takes the fresh air from outside the church, heats it, and delivers it to the auditorium at the floor near the rear of the room, while the foul cold-air is taken from the front and lowest part of the room, and exhausted by means of a foul-air shaft, which is heated by a small stove used in one of the side rooms of the church. In the foul air conduit is an arrangement by which the cold air can be turned into the fresh-air conduit leading to the furnace. This is used only while heating the church, when it is cut off from the furnace and again opened into the foul-air shaft, which is or should be kept open during the presence of an audience in the auditorium. The Sunday-school and lecture room is heated by a Grossius heater, manufactured in Cincinnati, and is supplied with fresh air from the exterior. Unfortunately, however, there was no provision in this room for the escape of the foul air, except by the doors and windows.

REMARKS.—With the exception of the Sunday-school room, the system for heating and ventilation used in this church is the best in the city, whilst the Sunday-school room could easily be remedied by placing a foul-air register in the ventilating shaft of the chimney.

It will be observed that, with two exceptions, there is not a church in our city that is provided with adequate means for the prompt removal of the carbon dioxide, the deadly poison that is exhaled with every breath. When we remember that it requires at least 1,500 cubic feet of pure air every hour to supply one human being, and when we know that the average movement of air through a conduit of 1 square foot capacity under ordinary circumstances, in mild weather, is about 150 feet a minute, and again take into consideration the miserly holes that are required to do this duty in supplying the majority of our churches, we are not surprised that people get sleepy when they attend church. It would be just as reasonable for each congregation to elect a committee annually, whose duty should be to give each mem-

ber a dose of morphine every time they enter the church, in order to stupefy them during the sermon, as to allow the ventilation of their churches to remain as they are, and poison their members with a drug that is even more dangerous than any of the modern narcotics, to say nothing of the disgusting and filthy custom of breathing and rebreathing the foul exhalations of their neighbors.

I have no doubt this lecture has already reached proportions that may weary some of you at least, but the importance of the subject is such as justifies me in trespassing still further on your patience, and hence I have left the most important part of our topic for the last.

When we remember that the youth of our city spend the best part of their days (from 7 years to 21 years) in our school-houses, and that among them is your daughter or my son, whose life and health depend on the perfection of their sanitary conditions and surroundings, it is sufficient excuse for our dwelling longer on this subject, and examining into their real condition and merits from a strictly sanitary standpoint. I shall try, however, to group them, and thus save time and space.

The first two school-houses examined were the Marion Avenue and John's Addition (new building). Both of these buildings have just recently been constructed, and were planned and built by Mr. F. D. Webber, of this city. As they are practically heated and ventilated on the same plan, I will consider them together in order to save time.

Each room is heated by a Grossius soft-coal heater, placed in the room to be heated, and supplied with cold fresh-air from the exterior of the building, conveyed to the heater by a tin conduit some 8 or 10 inches in diameter, with a perforated diaphragm placed near the exterior opening to lessen the amount of air admitted. This air passes through the hot-air chamber, and out at the top of the stove into the room. A number of foul-air ventilators are placed in the base-board at the floor, which the contractor informed me opened into the space beneath the floor, and from there into the foul-air shaft. These registers at the floor are 15×5 inches with one exception, which was 12×10 inches, and placed in the baseboard near the floor, and opened directly into the ventilating flue, which was warmed by the chimney.

REMARKS.—In the first place, the fresh-air supply was entirely too small for the number of pupils contained in each room, to give them the required amount of air, and the result was I found the teachers were in the habit of raising the windows to admit fresh air, at the expense of some unfortunate child taking cold from a draft, or being uncomfortable to say the least.

In the second place, I found that almost invariably the cold air was coming *in* at these foul air registers, placed around the room at the floor, instead of going *out*, except the ones opening into the ventilating flue direct, in which there was a strong outward draft. This fact necessitated the keeping of these closed, as they made the room very uncomfortable when left open. I think we can attribute the failure of these ventilators to work as designed to three possible causes:

First, that their size is too small, and the space between the floor and the ceiling is not sufficient to favor an outward draft.

Second, that the ventilating flue into which they emptied was too small, or not sufficiently heated to establish a draft under the circumstances, and

Third, that the supply of fresh air was not sufficient to supply the exhaust through the direct ventilator and the open transoms above the doors, and at the same time produce a draft through under the floor.

Whilst these two buildings are the best ventilated school-buildings in the city, yet I would recommend more fresh air, which should not be heated so hot while passing through the hot air chamber as it now is, and either no ventilators opening into the space beneath the floor, or if there are, to have them larger, with more space beneath the floor, with a well heated foul air shaft in order to secure a constant and perfect exhaustion of the cold foul air. As the buildings now exist, I would close all these floor ventilators except the one opening into the ventilating shaft direct, and make that one opening into the foul air flue at least two or three times larger. Whilst this would not secure perfection in heating and ventilation, it would be a vast improvement on the present, and avoid the dangerous and unsanitary habit of opening the doors and windows to obtain fresh air.

On the same date (January 22, 1889) I visited and examined the High School building, and on the 23d the Fourth Ward building, which we will consider together, as they are both heated and ventilated on the same plan. These buildings were erected some fifteen years ago by Mr. Hershiser, of this city, who put in a Boston system of ventilation. The rooms were all heated by a Grossius heater, supplied with fresh air from the exterior, while the foul air was *intended* to be removed by small registers, 18×4 inches, placed in the baseboard at the floor, and opened into a 3-inch or 4-inch tin conduit that descended into a 6-inch tin conduit placed beneath the floor, and which finally opened into the ventilating shaft.

REMARKS.—The same remarks hold good in regard to these buildings as to the former as regards their fresh-air supply, and the system of getting rid of the foul air is a total failure. Excepting the little ventilators that open directly into the ventilating shafts that were warmed by the chimney, there was no outward draft whatever, whilst in many of them that opened into a cold ventilating shaft there was a strong current of cold air coming in, which kept the floor cold

and uncomfortable. The same recommendations would apply to these buildings as to the former ones, which we are certain could still be improved by having furnaces placed in the cellar to supply the necessary amount of fresh air properly warmed, and thus avoid the necessity of carrying the coal up stairs and delivering it all over those large buildings as is now the case, saying nothing of the increased danger of fire by so many stoves.

On January 22, 1889, I examined the old school building in John's Addition, and on the 23d the old Normal School building, which we speak of only to condemn. They are both heated by stoves, with no provisions for fresh air, or the escape of the foul air, except at the doors and windows. In these buildings the air was almost intolerable, and the sooner they are condemned for school purposes the better it will be for the rising generation that must now be incarcerated in them from day to day.

The Second and Third Ward buildings were examined on January 23, 1889. Both were heated by the Grossius heater, which was supplied with fresh air from the exterior the same as the other buildings already described. In the old part of the Third Ward building the foul-air ventilators were placed at the floor as in the former buildings, but opened into the hollow wall, instead of a ventilating flue, which connected them with the garret. Some of these ventilators were working all right, but the majority were admitting *cold* air, instead of exhausting the foul air. In this building there were no ventilators opening directly into foul air shafts. In the new part of this building there were no foul-air ventilators at the floor, but a retrograde metamorphosis had apparently been established by placing three ventilators in the wall near the top of the room, whereby the foul air was left in the room, and a large portion of the warm pure air wasted.

In the Second Ward school building the new part has a foul-air register up stairs, 18 × 12 inches, opening into the hollow wall near the chimney, whilst the old part has no foul-air ventilators at all, and no registers, except some in the top of the room which, as usual, waste fuel by cooling the room and leaving the foul air in it. I found one 8 × 10 inch ventilator opening into the smoke flue at the floor up stairs in one of the rooms, while some of them were not provided with any kind of ventilation except the already so frequently condemned door-and-window ventilation.

On the same date we examined the last one of the city school buildings, located in Newman's Addition, which was built some ten years ago, and was heated by a Grossius heater, and supplied with fresh air from the exterior as usual. In this building there was an opening in the ventilator in the cellar, which very much interferes with its duties in the school-rooms, where it was most needed. In the lower room a foul-air register opened into the ventilating flue at the floor, but was so filled with dirt as to completely stop all exit of air through it. In the same room were a few small registers placed back of the teacher's stand, and located about halfway between the floor and ceiling, thus allowing the warm air of their room, with as much of the foul air as chanced to rise that high in the room, to escape, whilst from these to the floor was a 5 or 6 foot stratum of foul air which had no means of escape, and which was additionally cooled by reverse drafts of cold air which invaded the room very frequently through these upper ventilators. The up-stairs department was heated and ventilated on practically the same plan, which resulted in the teachers having to depend on window-and-door ventilation for their pupils.

In all these inspections, in which I was assisted by our worthy Superintendent of Instruction, Prof. Simpson, while examining the school buildings, you will observe I have examined fifteen churches and nine school-houses, every one of which I visited in person, from the cellar to the garret, and examined carefully their systems of heating and ventilation, and when necessary actually tested the drafts and currents of air by proper methods, to satisfy myself of their exact course; and whilst a few of them are fair, I have failed to find a single one complete, and the majority of them are simply horrible!

The question now most naturally arises after all these examinations, How shall we completely heat and ventilate our public buildings? In answer to this question, I will say there are three prime factors that must be duly considered. They are:

1. Uniform heating throughout each room.
2. Abundance of pure air for every person.
3. Prompt removal of foul air from each room.

Then, after having secured these, there are four other factors that must not be neglected. They are:

1. Safety.
2. Economy.
3. Durability.
4. Simplicity.

Having taken it for granted that we have secured *all* these, we will now proceed to answer the question of "How shall we completely heat and ventilate our public buildings?"

By a series of colored charts, and after having shown you the faults of your public buildings, I will continue to illustrate the complete plan, which involves the correct scientific principle of heating and ventilation, by the aid of these charts. Having done that, I will endeavor to confirm my statements by a practical demonstration of both the true and false principles of heating and ventilation by a model house. Before we take up the charts, permit me to say that in a properly heated room there should not exist in

any part of the same room a difference of over 5° to 10°, including the ceiling and the floor.

Provisions should be made to admit at least 1,500 cubic feet of air every hour for each occupant of a given room, which can easily be calculated when we know that on an ordinary calm day about 150 feet of air passes through a conduit one foot square in a minute, or in other words, 9,000 cubic feet, or just enough for six persons for a single hour. In addition to supplying the pure warm air to a room, there should be ample means for the prompt removal of all the foul cold-air, and under no consideration should the carbonic acid be allowed to exceed (and continue at that point) 10 parts in 10,000 of air, and much better if it is prevented from exceeding 5 parts in 10,000, especially in our school rooms. But the real facts are that it is seldom kept so low as 10, and often reaches 20 parts, and even more, to 10,000 parts of air.

If you will turn your attention to these charts, which have been carefully prepared from practical results of a long series of chemical and thermometrical investigations, and show the average relative purity of the air, as well as the temperature of the same, under the various systems of heating and ventilation they represent, you will, perhaps, more fully understand what I desire to make plain to every one here to-night.

In chart No. 1, you will readily recognize a familiar every day picture of the mother at her ironing, with a red-hot stove near by, and a window near the stove, let down from the top, through which is escaping a volume of hot air at the upper part of the opening, while a stratum of cold air is pouring in at the lower part of the opening to supply the vacuum produced by the escape of the former. From the lowered window of the leeward side of the room is a constant volume of cold air rapidly descending to the floor, and at the same time keeping that side of the entire room cold by forcing the warm air to the opposite side of the room. The mother's face is flushed with the heat from the stove and the exercise of the ironing, for which reason she has just opened the window to get a breath of fresh air, as she terms it. While the upper portion of her body is too warm, her feet are cold, and at the same time her little child is crying with the cold as it tries to play on the floor around her feet; and yet that mother goes to bed with a cough, and her child suffers with catarrhal trouble, and she "can't for the life of her see how it comes."

Only last Saturday I was visiting a child with congestion of the lungs, and lying in a cradle near the floor. I remarked that the room was not warm enough for it, when they promptly pointed me to the thermometer that was hanging about six feet from the floor and registered 72° Fah. I laid the same instrument on the floor beside the cradle for ten minutes, and showed then it registered 56°, or a difference of only 16°, and yet they were surprised that their child had been taken sick, for they were sure it had never been out of the house or exposed in any way to the cold.

Chart No. 2, represents the good old-fashioned grate "of ye olden times," when a man never lacked for exercise while trying to keep warm by it, for just as fast as he got one foot warm by crossing his legs and holding his foot up to the fire, his other foot would get cold, and he would have to change off and warm that, and at the same time while his face was flushed with the heat, the cold chills were playing up and down his back until he must turn that to the fire, when the other side would get cold; and thus he must ever turn like the spit before the fire to keep warm. You will readily see by this chart that it divides the room into two triangles; as the rays of heat travel in direct lines and the heated air rises, the natural consequences are that the side of the room next to the grate is warm from the level of the fire to the ceiling, while the opposite side is cold almost from the ceiling to the floor. You will see that each one of these form the perpendicular of a triangle; while we have a cold floor on the one hand, and a warm ceiling on the other, forming the bases, and a direct line from the fire to the opposite upper corner of the room forms the hypothenuse that divides, as it were, the cold foul-air of one-half of the room from the warm air of the other. It is no longer a question that the fire-place alone is a very defective method of trying to heat and ventilate a room.

We will now pass on to chart No. 3, which represents an attempt at heating a room without stove or grate. In this case the architect has decided to heat the room with warm air admitted at the floor in the centre of the room, and in full accord with the old theory that the foul air *rises*, he has decided to permit that to escape at the top of the room, just as I have found to be the case in several of our school rooms and churches in this city. Indeed, I am sure you would be surprised to find how many intelligent people, even at this day, will appear to be thunder-struck when you tell them the warm pure air is at the top of the room, and the foul cold air at the bottom of the same. Only a few days ago I met a gentlemen who still contended that such was the case, and insisted on not being reconciled to believe anything else. I asked him if he had ever made or saw made any chemical analysis of the air of various rooms? He said, "No." I then asked him how he knew that he was correct? He replied, "Why, because the physiology says so." That is the secret of the whole business. Some person said so, and hence, it must be so, whether it is so or not, and the general result is that no person takes the pains to investigate the

facts and correct the popular mistake, and consequently custom has to some people made a law.

You will see by this chart that like the smoke from the fire in the Indian's tent, the heat arises to the top of the room and out of the first opening it finds, and if the exit is equal to the inlet, the remainder of the room continues cold, and the foul air it contains remains unmolested. In trying to overcome this the architect has decided to change the plan of ingress of the warm air to the opposite lower side of the room from the place of exit at the ceiling, with a view of making the warm air travel a greater distance through the room, but the improvement, as you will see by chart No. 4, is so slight, and the results so unsatisfactory, that he must seek some other method in order to accomplish his ends, and warm the room and remove the foul air.

In chart No. 5, you will observe he has, in part, accomplished this by lowering the place of exit, and just in proportion as that is lowered, the portion of the room above is heated and ventilated, while that portion below is imperfectly heated and contains a stratum of foul air. You will remember I called attention to this fact in my report of the conditon of the St. Luke's church, of this city, which has its foul-air registers placed some three feet from the floor, and in consequence will leave an equivalent stratum of foul air in the room. You might just as well set a barrel on end and try to empty it by boring a hole, say a foot from the bottom. Of course, the water would all run out to a level with the bottom of the hole, which would leave a foot of water remaining in the barrel. The same is just as true of cold foul-air in a room.

In chart No. 6 the sanitary engineer has solved the problem and placed the inlet and outlet of the air both at the floor. The warm pure air is taken in at the floor and the foul air is removed at the floor at the opposite side of the room, and the consequence is that the entire room is heated and ventilated evenly throughout. That this method of heating and ventilating a room is a success is beyond question, and if there is a single person in this audience here to-night who questions its practicability, all I will ask him to do is to come to my house and I will show him the whole system at work in my own house, where it has proved successful beyond a question, and, besides, has very greatly diminished my coal bills, over the old plan of top-ventilation, which preceded it in the same house, besides supplying each inmate with over 1,500 cubic feet of warm pure air every hour, and removing the foul air to a standard not exceeding 4 or 5 parts in 10,000 at any time, day or night. Perfect as this plan is, it has still been improved upon, not in the way of ventilation, but in the economy of fuel and the comfort of the floors, by running the cold foul air through registers placed just beneath the windows and opening into the space beneath the floors, and from there into the foul-air ventilator, which warms and dries the floors, and thus is a saving on the fuel by causing this partially warmed air to pass through under the floor before it escapes up the ventilating shaft.

This ingenious and economical method of heating and ventilating was suggested and put into practice by that veteran sanitary engineer, of Toledo, Ohio, Mr. Isaac D. Smead, who has done more to develop and perfect the true scientific principles of heating and ventilating buildings than any one man on this side of the Atlantic Ocean, if not in the world.

As the old saying is, "Seeing is believing," hence before closing this lecture I will show you, by the aid of this model house, beyond a question that the principles I have endeavored to impress upon you are correct and based on scientific facts. You will observe that this is nothing but a tin box, made air tight, in the shape of a house, with a glass front in it. Here at this end is an opening at the floor to admit fresh air. At the opposite end is an opening at the floor leading into a chimney or ventilating flue, just as a fire-place or grate would. At the top of the room are six openings to represent windows. Now I will take this small wax candle, and from an opening in the floor I will place it in the lower part of the room near the floor and close the opening I will now close all the windows and just leave the opening at the floor for pure air and the other opening at the floor for the escape or foul air, open, and you will observe the candle burns brilliantly and uninterruptedly, or until it is consumed.

I will now close the exit for foul air at the *floor* and open all the six windows at the *top*, and you will find that the candle will burn for a while, but the carbonic acid (which is formed by the burning candle in the same manner as it is by a breathing person) being heavier cannot rise against gravity and escape at the windows, and hence settles down at the floor, and just as soon as it fills the room to the height of the blaze in the candle, the light begins to turn blue, flickers, and finally dies from carbonic acid poisoning.

Again, if I close the opening for the admission of pure air at the floor, and also the opening for the exit of foul air at the floor, and open the six windows, all at the top of the room, the candle goes out much sooner than in the previous experiment; for in this experiment the supply of fresh air is diminished as well as the escape of the carbonic acid prohibited, and here you see the folly and unscientific principle of opening the windows at the top to ventilate a room.

Now, if I close the windows at the top, and also the opening for the foul air at the floor, and only open the ventilator for the admission of pure air, the candle is again extinguished by the foul air which accumulates on the floor of the room,

as there is no circulation of air in this case, and the poisonous gas cannot escape. Or, if I reverse this experiment, close the opening for the admission of pure air, and open the foul-air ventilator at the floor, the candle again dies from from carbon dioxide, which for want of circulation cannot escape, and the result is fatal to the candle.

It seems to me that these experiments which have been strengthened time and again by chemical analysis, are sufficient to demonstrate to any unbiased mind the fallacy of so-called top ventilation, as compared with floor ventilation. I am sure if the principles here demonstrated by this simple model were put into practice in our city schools and churches there would be fewer of our school children coming home in the evening with headache and general languor, and fewer drowsy persons in our churches during divine service than we see now, which can usually be attributed to defective ventilation and the result of a slow process of poisoning from carbonic acid, saying nothing of its effects on weak lungs and its general depression on the whole economy. For let us remember before we close, what we said at the beginning of this lecture—that pure air is one of the three essential compounds for the support of human life.

Mansfield, Ohio, Feb. 11, 1889.

THE ETIOLOGY OF DIPHTHERIA.

Read before the Section for Clinical Medicine, Pathology, and Hygiene of the Suffolk District Medical Society, Feb. 13, 1889.

BY SAMUEL N. NELSON, A.M., M.D.,
OF BOSTON, MASS.

Concerning the origin of diphtheria much discussion has arisen. Although its infective character has been doubted by some, it is now quite universally accepted; and I shall confine my remarks to a brief review and discussion of the etiology of the disease from the standpoint of the biologist.

I shall adhere to the classification of microorganisms that is now universally adopted, viz., using the term "bacteria" in a generic sense, including both the

Micrococci, the ball forms and the

Bacilli, the rod forms.

That bacteria were early found in diphtheritic membrane, even before the recent improvement and perfection of the microscope permitted the researches and investigations resulting in the discovery of many pathogenic microörganisms, is not to be wondered at, when we realize that the healthy human mouth is constantly infested with bacteria of various kinds; not less than thirty different varieties having been isolated and cultivated by my friend Prof. W. D. Miller, whose labors have won for him the distinction of being the only American who has been honored with a professorship in the University of Berlin. We must remember, however, that it is one thing to prove the existence of microörganisms in a diphtheritic false membrane, and another thing to prove that these germs are the *cause of the disease*. The difficulties are very great, and in the case of diphtheria as perhaps in no other disease, do we realize the importance of the isolation of the bacteria and their cultivation in a pure state, together with the reproduction of the disease by inoculation of the cultivated germs; before an attempt can be made to judge whether they are present as the cause of the disease, or are there, as most of them undoubtedly are, only as a result of the diseased state affording favorable conditions and soil for their growth and development.

The first reference to the idea that diphtheria is of parasitic origin, that I have found, is an article by Prof. Lacock,[1] and the idea was afterwards revived by Jodin.[2]

Ortel[3] says concerning bacteria in diphtheria: "They were discovered as far back as 1868, by Buhl, Hueter, and myself (I called them at that time micrococcus) in false membranes, the blood, and the tissues; in like manner they were demonstrated by von Recklinghausen, Nassiloff, Waldeyer, Klebs, Eberth, Heiberg and others in the most different organs and tissues. In secondary infection of wounds, tracheotomy incisions, and ulcers, the grayish skin-like false membranes, as well as the tissues themselves, are crowded with these organisms."

In a "Treatise on Diphtheria," 1880, Dr. A. Jacobi reminds us that "Buhl was the first to discover schizomycetæ in diphtheritic membrane, but expressed no opinion as to the part they played in the process." Hüter found them in the gray diphtheritic covering of wounds, in the surrounding apparently healthy tissues, and in the blood. Hüter and Tomasi found them in the diphtheritic membranes of the pharynx and larynx, inoculated them on the mucous membranes of animals, and described them as small, round or oval, dark-colored, active little bodies. The latter observers look upon these organisms as a part of the infectious element. Oertel found them in diphtheritic membrane and in inflamed mucous membranes, in the lymphatic vessels, lymphatic glands, kidneys and other organs; he considers them at the bottom of the diphtheritic process and constituting the contagious element.

Nassiloff, too, after inoculation in the cornea, noticed an enormous multiplication of the microscopic organisms, and their appearance with pus-cells in the lacteals, and in the lymphatics of the palate, and even in the bones and cartilages. He asserts that the development of organisms is the primary step in the diphtheritic process.

[1] Medical Times and Gazette, May 29, 1858.
[2] "De la nature et du traitement du croup, etc.," Revue Méd., t. i. pp. 22 and 134. Paris, 1859.
[3] Cyclopædia of the Practice of Medicine, Ziemssen, American Edition, vol. i, page 588.

Eberth made successful inoculations in living tissues: the microörganisms, introduced into the cornea, proliferated actively and caused an inflammation of irritative character, in the surrounding tissue. He asserts[4] that diphtheria cannot occur without bacteria. Klebs inoculated the micrococci in pigeons and dogs and demonstrated the presence thereof in the blood of the animals after death. Orth found them in the pleura, lungs, kidneys, and urinary bladder."

Giacchi[5] believes that a parasite is as necessary in the pathogenesis of diphtheria as the *Oidium vitis* is in the production of the disease of the grape.

Letzerich[6] also differs from other German observers in regarding a true fungus, *Zygodesmus fuscus* as the specific contagion of diphtheria.

The *Micrococcus diphtheriæ* Oertel[7] is thus described: "It has an oval form with a length of 1 to 1.5μ, and a breadth of 0.3μ; larger individuals, found nearer the surface, being 4.2μ long, and 1.1μ broad. Where the individuals are more scattered, they occur mostly in pairs, rarely a number connected into a torula-like chain. When present in masses, the cells lie so close together that it is difficult to determine whether they are connected or not. They are then imbedded in a gelatinous envelop, and thus combined in masses into a colony."

Talamon[8] does not recognize the Zygodesmus fuscus of Letzerich nor the Mycrosporon of Klebs, as the cause of diphtheria, which he believes to be a mycelium with characteristic growths from 2 to 4 or 5μ size, and having two kinds of spores:

a. Round or oval spores, which are the spores of germination, which occur in zooglea, and

b. Rectangular spores, which represent the third term of development of the fungus. These he has cultivated and inoculated on the mucous membrane of the mouth and nose of six rabbits, two guinea pigs, four frogs, one cock, and four pigeons, with reproduction of the membrane and death of some of the animals.

Klebs[9] mentions that at first he supposed there was only one form of microörganism present in diphtheria. This he called the *Microsporon diphtheriticum*, and he claimed that it produced both rods and cocci, as different forms in the development of the same organism. Afterwards, however, he says he recognized another form of diphtheria, which was characterised by the presence of bacilli. The latter form he found at Zurich. It corresponded with the first form only in the gross anatomical changes. The latter form is characterized by the tendency to an extremely rapid extension of the membrane into the trachea, even while the affection in the pharynx is still in active process. Death usually occurs from suffocation.

Morphologically Klebs says that the bacilli are long and narrow, and that they hardly attain the size of the bacillus tuberculosis. Two spores are always found in each rod. When the diphtheritic membrane is dried gradually over sulphuric acid at the ordinary temperature, the spores increase very rapidly, and then rods may be found which contain no spores, while others contain four spores. He is convinced, he says, that a true diphtheria exists only when rod-shaped organisms are present in the membrane. This allows of two possibilities; in the microspore form we have micrococci, together with somewhat long rods which do not contain spores, and in these cases a general infection is rapidly developed. In the bacillus form, on the contrary, which is first dangerous on account of its rapid extension on the mucous membranes, we find a great number of small rods which contain from two to four spores.

We learn from the address of Dr. E. G. Barnes[10] that Loeffler, whose investigations were extensive and are published by the New Sydenham Society, found, in the cases he examined, two organisms present in large numbers; the one were chain-forming micrococci or streptococci; the other the bacilli described by Klebs as characteristic of diphtheria. The streptococci may be exonerated from being the active cause of diphtheria by the fact that they are present in various other diseases which are accompanied by lesions of the mucous membrane; for example, small-pox, typhoid and puerperal fever, and therefore may be regarded as accidental; that they are found only in a limited number of cases of human diphtheria, and that, when inoculated on lower animals, they never produced a disease even resembling it. Much stronger evidence was shown by Loeffler in favor of Klebs' bacillus being the true cause, and he even produced a similar disease by inoculating them on lower animals; but, on the other hand, he found they were not present in a number of undoubted cases of diphtheria; that in the false membrane he produced by introducing them through a wound in the trachea in rabbits and fowls, he did not find them in the same typical arrangement as in man; that they produced no effect in several animals otherwise susceptible to their action when applied to the uninjured mucous membrane of the fauces, respiratory passages, eyes and vagina; that paralytic symptoms did not occur in the inoculated animals; and, lastly, that in one case he found a perfectly indistinguishable bacterium in the saliva of a healthy child.

[4] Zur Kenntn. der bacterit. Mykosm, 1872.
[5] "Natura e Therapia dell' angina difteria" Lo Sperimentale, November, 1882.
[6] Virchow's Archiv. Bd. xlv. et seq.
[7] Zur Ætiologie der Infectionskrankheiten, 1881; and Journal Roy. Mic. Soc., ser. ii. vol. ii. p. 88.
[8] Progrès Med., 1881, ix. pp. 122 and 49.
[9] Verhandlungen des Congresses fuer innere Medicin, 1883, pp. 139 to 154.
[10] British Medical Journal, July 28, 1888.

Many allusions are now being made in the secular press to the work recently done in Pasteur's laboratory, which has been described in the *Gazette Hebdomadaire de Med. et de Chir.*, January 18, 1889. MM. Roux and Yersin constantly found the bacillus of Klebs and Loeffler, which they describe to be a little thicker than the bacillus tuberculosis and of the same length. This description, you will observe, differs a little from the original description of Klebs quoted above. They have cultivated the bacillus, and their inoculation experiments have produced paralysis, without which they do not consider the proof of real diphtheria conclusive.

My own experiments in the cultivation and inoculation of the bacteria of diphtheria were made several years ago, and are reported in a paper read before the meeting of the Eighth International Medical Congress at Copenhagen in 1884.[11]

In November, 1883, I assisted Dr. H. O. Marcy in performing the operation of tracheotomy upon a child 3 years old, who was suffering from a severe attack of diphtheria. He was *in extremis* at the time of the operation, the breathing being very short and difficult. Membrane covered both tonsils. The operation was successfully performed and a tube inserted, when the breathing became perfectly free. Previous to the introduction of the tube, a complete membranous cast of the trachea was removed through the opening. The subsequent history was unfavorable, for the child died of blood poisoning about thirty-six hours later.

Soon after the operation I inoculated one of my culture bulbs with a small piece of the membrane removed from the trachea. These bulbs are made after those of Sternberg, of the United States Army, which I then preferred to the method of culture on solid culture-media; I had not become thoroughly familiar with the latter method until some months later in Berlin, when I was soon convinced that it affords many advantages that cannot be obtained from cultures in bulbs. These bulbs are made from ordinary glass-tubing about three-tenths of an inch in diameter. In one end a bulb is blown, and the other extremity is drawn to a fine capillary point. These I made myself in quite large quantities at a time. They were filled two-thirds full with a sterilized beef-bouillon, then hermetically sealed, and in this condition they will keep indefinitely if successfully made.

For cultures I found it best to use bulbs which had stood the test of a temperature of 70° to 100° F. for several weeks; for if they remain clear and pellucid at the end of this time, any subsequent changes that might occur are due to the substances introduced.

[11] Compte-rendu de Congrès Périodique International des Sciences Médicale, 8me session, Copenhagen, 1884, t. i. Section de Pathologie Général et d'Anatomie Pathologique, p. 114.

Four days after the introduction of the diphtheritic membrane as seed, the liquid in the culture bulb kept at temperature of 70° became cloudy or turbid, and when examined with the microscope at 1,000 diameters, there were found immense quantities of a micrococcus, identical with those seen in the fresh membrane. This micrococcus has about the diameter of the micrococcus of pus, and is very slightly elongated. They were grouped in clusters of a few members each and belong to the group of staphylococci.

A second culture bulb was inoculated with a fraction of a drop of the liquid in the first, and three days later the same cloudy appearance was noticed, and examination showed identical micrococci. In this way the cultures were carried through ten generations, in each case several bulbs being inoculated at a time, and each one breeding true in three days. In all, about fifty bulbs were used.

My subsequent experiments of inoculation were carried on with the advice and assistance of Dr. Wm. F. Whitney. Four guinea pigs were inoculated in the cornea with the contents of one of the bulbs containing the culture of the sixth generation. One of these animals died thirty-six hours later of blood poisoning. The others became very ill, losing their appetite and the eyelids becoming much swollen and œdematous, with profuse discharge which contained the micrococci. The cornea became cloudy and was covered with a membrane. Two of these animals were killed on the third day after inoculation, this being the period at which the micrococci developed; one was allowed to get well, but the eyes were completely destroyed.

In the aqueous humor of the eyes dissected there were found micrococci, which were also found in sections of the cornea of the eyes, which had been placed in alcohol immediately after removal, and when hardened were cut with a microtome.

These experiments are limited in number and, I know, need further confirmation; but as far as they go they seem to show that there is a micrococcus of diphtheria which can be cultivated, and which when inoculated in the guinea pig produces diphtheria.

If, however, further proof is needed I can give it; for on the third day after killing the animals, and after no other exposure, I myself became ill, developing a severe attack of diphtheria, which appeared first in one tonsil and the uvula, and then on the other tonsil, being accompanied with severe constitutional symptoms and followed by a slow and tedious recovery. This has proved, to my satisfaction, at least, the correctness of these views.

Thus we see in brief review the chain of the sequence of events:

A typical case of diphtheria in a child;

The presence of micrococci in the membrane;

The cultivation of the micrococci in pure cultures to the tenth generation;

The inoculation of guinea pigs with micrococci of the sixth cultivated generation, and reproduction of the disease;

The unwitting inoculation of the experimenter, thus bringing the disease back to its original form in a human being.

PHTHISIS PNEUMONICA ET LARYNGITIS CHRONICA.

Read before the Medical Society of the District of Columbia, December 12, 1888.

BY A. A. HOEHLING,
MEDICAL INSPECTOR, U. S. NAVY.

C. H., Corporal U. S. Marine Corps, native of Wilmington, Del., age, 41 yrs. 8 mos., enlisted at Annapolis, Md., August 14, 1887. Admitted from U. S. Naval Academy, Annapolis, Md., at 2:30 P.M., September 19, 1888. Died November 21, 1888.

"The patient has had sixteen years' service in the U. S. Marine Corps. Dates the beginning of his ill-health in September, 1887, when he 'caught cold' sleeping on deck on board the U. S. S. 'Dolphin' on a passage from Annapolis to Philadelphia. He has been from time to time under treatment at this station, but has continued on duty until two days ago. He has in the last twelve months had fever from time to time, night sweats, cough and progressive emaciation, with loss of appetite. He has percussion dulness at tops of both lungs, irregular expiratory blow and subcrepitant râles, most abundant on right side in front. He has had occasional hoarseness for six or eight months. This has grown rapidly worse in last ten days, with irritation of larynx, hoarseness of voice almost to extinction, and much difficulty and pain in deglutition. Epiglottis is thickened and distorted, and left aryteno-epiglottidean fold swollen, and encroaching upon cavity of larynx to such an extent as to obstruct view of vocal cords. Patient has had cod-liver oil since September 1. Last two days spraying of larynx once a day with sol. nitr. silver, gr. v to ℥j, also three times a day with a 2 per cent. sol. cocaine before eating."

At present he has the characteristic appearance of a consumptive, is considerably emaciated, cannot speak above a whisper, and swallows liquids with much difficulty; He has bronchial breathing at the apex of both lungs, and below this, especially on right side, subcrepitant râles take the place of the normal vesicular murmur. Laryngoscopic examination reveals an œdematous and congested state of aryteno-epiglottidean folds and the epiglottis much thickened, interfering with deglutition. Ordered diet of milk, eggs, rare beef and corn-starch. To have ol. morrhuæ and whisky, and to use steam atomizer with wine of ipecac.

September 23. Morning temperature has been normal and evening temperature has been about 101° daily. Expectoration profuse. Cough harassing, and breathing labored on account of condition of throat; deglutition somewhat improved. Treatment continued, to use also ammon. hydrochlor. sol. in atomizer.

September 27. Condition slightly improved. Continue treatment.

October 3. Patient states he has gained 8 lbs. since admission to hospital. Laryngeal symptoms remain unchanged; less expectoration. Temperature range A.M, normal, P.M. about 100.4°. Is taking ol. morrhuæ and beer. Is using a spray of tr. ferr. chlor., alternating with a spray of vin. ipecac.

October 10. Condition continues about the same. Throat sprayed twice daily with Dobell's solution and sol. cocaine, followed by application of equal parts of tr. iron and glycerine. Deglutition seems improved. Continue treatment.

October 20. Evening rise of temperature less, about 99.6°. General treatment continued. Is losing in weight and strength.

October 27. Patient is gradually failing. No ulcers apparent in throat yet. Continue general treatment.

November 6. Patient very weak. Expectoration profuse, cough harassing, deglutition much impaired, but the patient is very hopeful. Ulceration of the cords apparent, though a good view cannot be had. Continue treatment.

November 12. Patient is failing slowly, is now confined to bed. There is apparently a large cavity in right lung and left lung seems much involved; cough harassing, expectoration profuse. Supported by milk-punches. Swallows with difficulty. Treatment continued.

November 16. Scarcely able to swallow anything; very weak, failing slowly.

November 17. Very weak. Refuses to take nourishment by mouth. Ordered enemata of beef-tea and whisky every three hours.

November 19. Very weak; supported by enemata of egg-nogg, beef-tea, milk, etc.

November 20. No change.

November 21. Died at 2:25 P.M.

Necropsy twenty hours after death. Body greatly emaciated; rigor mortis passing off. Upon opening the thorax the pleura was found firmly adherent to the chest wall and diaphragm (entirely obliterating the pleural cavity), requiring considerable force for its detachment.

Pericardium contained about 60 cc. of clear serous fluid.

Heart normal. The cavities contained each a small amount of dark blood clots, and large fibrinous clots extended from them several inches into the large vascular trunks.

Lungs were studded with miliary tubercle, increasing in quantity from apex to base; on section the tissue seemed exsanguine, of a grayish color, dotted with the black tubercle and filled with numerous cavities, varying in size from a pin to a small orange, containing offensive pus, with the exception of a small portion at base of each lung which was highly congested, with tubercle throughout its substance. All the smaller bronchial branches were obliterated by the tubercular deposit in the surrounding portion of the tissue. Fibrinous bands were found between the lobes and the larger cavities were lined by a similar membrane.

Larynx.—The upper part of posterior portion of the thyroid, the arytenoid, the epiglottis, and the ligaments and attachments corresponding to these, with the vocal cords, were destroyed by ulceration.

Abdominal viscera not examined, and cranium not opened, as it was deemed unnecessary.

NOTES ON TWENTY-SEVEN CASES OF DIPHTHERIA,

OCCURRING BETWEEN JULY 1, 1888, AND JANUARY 1, 1889.

Read before the Section for Clinical Medicine, Pathology and Hygiene, of the Suffolk District Medical Society, January 19, 1889.

BY HENRY JACKSON, M.D.,
OF BOSTON.

From July 1, 1888, to January 1, 1889, I treated twenty-seven cases of diphtheria out of 1,031 cases of all kinds, seen in the second district of the Boston Dispensary, situated on the West side of Hanover street. Of these cases, five died; four of septicæmia, one of laryngeal obstruction.

Five cases were very mild; two were not confined to the bed.

In most of the cases the membrane was confined to the uvula and pillars of the pharynx. In these cases a large part of the roof of the mouth and lips was covered with membrane. Fifteen cases occurred in houses where the sanitary condition was bad. Ten case where the sanitary condition was apparently good. Two cases in a house that seems to be in good condition, and yet one where I have found much sickness in the last two years, notably diphtheria last winter.

Where there were several children in a family, usually one or more cases of diphtheria appeared shortly after the first cases, Namely:

In a family of three children all had the disease.

In a family of five children four had the disease.

In a family of three children two had the disease; later in the year two members of this family had typhoid fever. In all cases the disease was strictly confined to the house where it first appeared, and in only one instance did the disease spread to other families living in the same tenement.

Of the twenty-seven cases four were young adults; the average age of the children was 5 years, the youngest being 18 months.

As of importance in making an early differential diagnosis between diphtheria and follicular tonsilitis, I have found that in diphtheria:

1. The temperature was much lower, often normal.

2. The constitutional symptoms were usually less severe at first.

3. The glands about the neck were more swollen and tender.

In all cases I have felt justified in making a diagnosis of diphtheria where there was membrane on the uvula or on the pillars of the pharynx.

As last year I could report that, having had in my charge in this district a large epidemic of scarlet fever, I was not aware of having carried the disease to a single child, so this year not a case of diphtheria has occurred in a family that was under my care for other diseases.

In other words, so far as an opinion can be formulated from so small a number of cases, the disease is very infections to young children brought in immediate contact with those sick; the disease does not spread from house to house; the disease is not easily carried by a third person.

The following list shows the character and distribution of the various infectious diseases in the portion of the city above described, during like periods of two successive years.

JULY, 1887, TO JANUARY, 1888.

Diphtheria	8
Tonsillitis	57
Scarlet fever	68
Measles	5
Typhoid	24

JULY, 1888, TO JANUARY, 1889.

Diphtheria	27
Tonsillitis	33
Measles	5
Scarlet fever	1
Typhoid	23

MEDICAL PROGRESS.

NERVE-GRAFTING.—At the meeting of the Clinical Society of London, on January 25, MR. MAYO ROBSON showed a girl, æt. 14, on whom he had successfully grafted two inches and a half of the posterior tibial nerve into a corresponding gap in the median nerve in the forearm. He also showed the tumor which had involved the median nerve, and had necessitated its removal. The history of the case, briefly, was that the patient had noticed the tumor growing for six years, but that it had grown more rapidly during the past twelve months, during which time it had

caused considerable inconvenience as well as deformity. The tumor, about the size of hen's egg, extended from the annular ligament in front of the right wrist up the forearm for about three inches, reaching laterally from side to side, the skin being firmly stretched over, but not adherent to the tumor, which appeared to be solid or semi-solid. On making an incision over the swelling the tumor bulged through the wound, and was easily separated from its cellular bed, leaving the mass attached above and below to a cord, which appeared to be inseparably blended with it. The attachments had therefore to be cut through. A microscopic examination showed that the cord was composed of nerve tissue, and on the patient recovering from the anæsthetic the parts in the hand supplied by the median nerve were found to be devoid of sensation. Arrangements were made by Mr. Robson to graft the sciatic nerve of a rabbit into the gap of the median nerve, but fortunately his colleague, Mr. Ward, kindly allowed him to arrange his operation at the same time that he was amputating a thigh, and to utilize the posterior tibial nerve, which was taken straight from the amputated leg into the prepared forearm, the transfer from one theatre to the other being made in a warm carbolic solution. Two inches and a half of nerve were utilized, the ends being attached to the proximal and distal portions of the median with a fine catgut suture, without the slightest tension either on the stitches or the nerve; the wound was well washed out with perchloride of mercury lotion and carefully sutured. Healing occurred by first intention. The grafting was performed forty-eight hours after the tumor had been removed, and thirty-six hours after the nerve had been grafted, sensation had so far returned in the parts supplied by the median that the touch of a pencil could be localized. Day by day sensation became more and more distinct, until when shown to the members of the Leeds and West Riding Medico-Chirurgical Society, five weeks after the operation, it was so perfect that the slightest touch could be localized, and although there was manifest diminution in volume of the abductor and flexor brevis pollicis, they were not completely paralyzed. Mr. Mayo Robson, after relating experiments on animals, which went to prove that reunion and even regeneration of nerves might occur, remarked that in such cases, where there had been absolute loss of nerve, return of function did not occur. He thought the case he had related presented very important physiological and clinical features: physiological, in that the living nerve must have immediately united and taken on function, so that thirty-six hours afterwards the distal portions of the median were functionally active; clinical, in that, if nerve grafting to such an extent could be certainly relied on, many hitherto hopeless cases may be cured—for instance, in injury of an extremity with destruction of one or more chief nerve trunks, in the case of a tumor involving nerves, in paralysis due to cicatricial destruction of nerve, and in many other cases. He ventured to hope that, if, as in this case, two inches and a half of nerve would live, further experiments might show that greater lengths might survive; or if such were found to be impossible, that the grafting might be done piece by piece as in the case of bone grafting. The condition which he advised to be observed in such operations were: first, entire absence of tension in the grafted nerve—*e.g.*, two inches and a half being employed to fill an interval of two inches and a quarter; secondly, great care in dissecting out and handling the nerve; thirdly, immediate transference of the living tissue into its new bed; fourthly, the employment of only a single suture to fix the ends of the nerves; and fifthly, strict asepsis. He thought that this case, if he had correctly interpreted it, went to disprove the theory that a primary union of the divided ends of a nerve is only an appearance of union, and not a physiological one, and that the distal ends must pass through a process of degeneration before regeneration. He remarked that the return of function in the motor portion of the nerve was more gradual than in the sensory, and made suggestions which he thought might explain the difference. MR. BRYANT asked whether the suture had included the whole thickness of the nerve. MR. BOWLBY observed that the case seemed likely to prove a successful one, but at present it was not entirely so. It was the first recorded case of nerve grafting in this country, although a number of experiments and operations had been published on the Continent. This was the first case of primary grafting of a nerve—that was, within forty-eight hours of the injury. He pointed out that in a certain number of instances there had been restoration without re-establishment of continuity of the nerve. He had quoted several instances of the kind in his lectures at the College of Surgeons.[1] Still, on examining that particular patient, he found more sensation than he had ever seen before under similar circumstances. The condition of the muscles was not quite healthy, but still satisfactory. He mentioned as a curious fact that the power of voluntary motion often returned long before there was any reaction to electricity. He had remarked a bulla on the tip of the patient's index finger, which seemed to point to a trophic lesion. He questioned the accuracy of the view generally held, that after primary suture of the two ends of a divided nerve the lower end necessarily underwent degeneration. In a case in which he had brought the ends together, although fully an inch had been cut out, complete restoration of function ensued in a few days. In another case in which

[1] Vide the Lancet, Vol. ii, 1887.

union by primary intention took place, although there was no paralysis, yet for a long time there was no reaction to electricity. He also pointed out that sensation was a very vague term, and might exist in very varying degrees. Mr. Robson's patient still experienced numbness and tingling in the fingers, showing that sensation, if good, was not perfect. MR. BLAND SUTTON urged that it did not follow, because restoration of function had taken place after joining the cut ends of the nerve by means of a piece of the posterior nerve, that the latter had become incorporated with the median nerve. In experiments that had been carried out on animals it seemed that anything which acted as a conductor, so to speak, along which the reparative material passed, bits of chicken bone, catgut, etc., had been found to answer the purpose. The bullæ which had been noticed generally took some time to form, and he suggested that the patient was now getting the symptoms which would have followed had the grafting not been effected. He hoped that the future progress of the case would be carefully watched, and the additional information added to the report when published in the Transactions. THE PRESIDENT mentioned the case of a man from whom, in the course of an operation for the removal of a tumor, he had accidentally removed a large piece of the external popliteal nerve—too much, in fact, to admit of the ends being brought together. Loss of sensation and muscular degeneration followed in the parts supplied by the nerve, and the patient left the hospital in a rather unsatisfactory condition as regarded the leg. Some months later he looked the patient up, and found to his surprise that function had been restored, and the patient said he was as strong in the leg as ever he was. MR. MAYO ROBSON, in reply, admitted that the case was not yet an unqualified success, but its progress had been so uninterruptedly satisfactory that he quite anticipated it would ultimately become so. He had passed a very fine catgut suture through the whole thickness of the nerve. He observed that even if the piece of the posterior nerve had not become incorporated with the median nerve, yet, in view of the successful issue of the case, most persons would be inclined to commend the course that had been adopted.—*Lancet*, Feb. 2, 1889.

HYDROXYLAMIN IN SKIN DISEASES. — DR. EICHOFF, of the Municipal Hospital, Elberfeld, has found an admirable substitute for pyrogallic acid, chrysarobin, and other powerful reducing agents used in external applications for skin diseases in hydroxylamin, which is, chemically speaking, an ammonia in which one of the atoms of H is replaced by HO. The most suitable compound for dermatological use is the chloride, the formula of which is $NH_2OH.Cl$. This occurs in colorless, strongly hygroscopic crystals, which are readily soluble in water, glycerine, or spirit, the solution showing an acid reaction. When introduced into the blood, hydroxylamin forms methæmoglobin, the blood rapidly becoming of a deep-brown color. In large doses—that is to say, 0.01 gram per kilogram of body weight—it produces hematuria in consequence of the destruction of the red corpuscles. It also acts on the nervous centres, producing narcosis. The high reducing power possessed by hydroxylamin renders it a powerful poison to low organic forms, and on this account it is to be very strongly recommended in dermatology. The preparation used by Dr. Eichoff is the hydrochlorate dissolved in a mixture of equal parts of glycerine and spirits of wine in the proportion of 1 per 1,000. This is applied with a brush to the affected parts of the skin, which must first be carefully washed with soap three to five times a day. In this way he has treated five cases of lupus, five of ringworm, and one of parasitic sycosis, with excellent results. These were specially remarkable in two cases of very severe lupus. Dr. Eichoff is hopeful that this remedy, which may sometimes perhaps be applied in the form of subcutaneous injections, may be found useful in psoriasis, parasitic eczema, and even in lepra and syphilis. He, however, warns those who propose to try it that it is a very powerful irritant, and that even for outward application a strength of 1 per 1,000 is quite enough.—*The Lancet*, February 9, 1889.

ACTION OF PARALDEHYDE.—DR. JOHN GORDON, of Aberdeen, after an extensive series of experiments and observations in regard to paraldehyde, summarizes his results as follows:

1. Paraldehyde caused an increase in the excretion of urea. 2. It did not in any marked way affect the quantities of chlorides excreted. 3. It did not invariably increase the excretion of the fluid constituents of urine, but in the majority of cases which I have recorded it diminished them. 4. The odor of paraldehyde, when given in large doses, was found in the urine, showing that some of it probably passed unchanged through the system. 5. After the full dose of the drug the respirations were slowed, and rendered tranquil and steady. 6. It had no appreciable effect on temperature. 7. In cases of average health without sleeplessness it did not have any hypnotic influence except in large doses. 8. It caused no loss of appetite. 9. There was sometimes a tendency to perspiration under its influence, which atropine controlled. 10. The blood-pressure was only slightly reduced by the smaller doses, the larger dose reducing it more, but only after distinct slowing of the respiration. 11. The pulse was slowed. 12. It diminished the reflex excitability of the spinal cord. 13. It had a peripheral influence in controlling sensation. 14. It speed-

ily diminished, and in large doses destroyed, the irritability of motor nerves. 15. Equal doses diminished the excitability of motor nerves sooner than that of muscle. 16. Small doses first slightly excited and then diminished the excitability of muscle substance. 17. Large doses speedily destroyed (temporarily) the irritability of muscle substance. 18. There was a tendency to complete recovery in the muscle after a small dose, but seldom complete recovery after a large dose. 19. Curarized muscle showed increased excitability over non-curarized muscle when treated with an equal dose of paraldehyde and equally stimulated.—*British Medical Journal*, March 9, 1889.

CHLOROFORM IN DYSPEPSIA.—Chloroform administered in the various forms of dyspepsia overcomes fermentation and flatulence; it is best given in one of the following formulas:

1. *Method of* DR. WILS.—From ten to twenty drops of chloroform, to be taken in a few spoonfuls of sweetened water, in flatulent dyspepsia. After a few minutes eructations occur, followed by improvement.

2. *Method of* DR. HUCHARD.—Administer before each meal one dessertspoonful of the following:

℞. Chloroform water . . . . . 150 parts.
Mint water . . . . . 30 "
Water . . . . . 120 "
M.

Or, from eight to ten drops of the following mixture in a wineglass of water:

℞. Tincture of nuc. vomica, Tincture of gentian, Tincture of anise ää ʒj.
Chloroform . . . . . gtt. xx–xl.
M.

An appropriate diet and oxygenated waters at mealtimes form part of this treatment.

3. *Methods of* DRS. REGNAULT *and* LASÈQUE.—This treatment applies particularly to painful dyspepsias with dilatation of the stomach:

℞. Chloroform water . . . . . 150 parts.
Orange-flower water . . . . . 50 "
Water . . . . . 100 "
M.

One dessertspoonful to be taken, at intervals of fifteen minutes, until the pain ceases.

Or the following for the same affections:

℞. Chloroform water . . . . . 150 parts.
Tincture of anise . . . . . 5 "
Water . . . . . 145 "
M.

—*Revue gén. de Clin. et de Thérap.*, Feb. 28, 1889.

ANTIPYRIN IN LABOR.—DR. ERMANNO PINZANI recently made a communication to the Società Medico-Chirurgica di Bologna,[1] in which he gave an account of some experiments he had made with the view of ascertaining the effect of antipyrin on the strength of the uterine contractions in labor. Two series of experiments were made. In five cases he simply kept his hand on the woman's abdomen for some hours, and noted the condition of the uterus before and after the administration of the drug. In eight other cases (on which he made in all twenty-three experiments) he passed an India-rubber ball, first disinfected, and then filled with a watery solution of corrosive sublimate, into the uterus; this he connected with a manometer, which gave him an accurate gauge of the pressure exerted by uterine contractions on the fluid in the ball. Dr. Pinzani was careful to exclude irritation of the uterus by the foreign body as a source of fallacy by previously warming the fluid in the ball to the temperature of the body, and by waiting for some time time after its introduction before making observations. In the first set of experiments, 3-gram doses of antipyrin were given by the mouth; in the second, the doses were from 1 to 2 grams. Dr. Pinzani came to the conclusion that antipyrin relieves the pains of labor simply by lessening the force of the uterine contractions. The effect of the drug showed itself in about two hours after hypodermic injection, and four or five after administration by the mouth. He noticed that infants suckled by women who had had antipyrin given them during labor were apt to suffer from diarrhœa. Dr. Pinzani's verdict is, therefore, decidedly against the use of antipyrin in midwifery practice.—*British Medical Journal*, March 9, 1889.

[1] Gazzetta degli Ospitali, February 10, 1889.

IGNIPUNCTURE OF THE TONSILS.—DR. WILHELM ROTH, of Fluntern, finds that in order to reduce the size of the tonsils without risk of troublesome hæmorrhage, which is not uncommon, especially in young subjects, the best plan is to employ ignipuncture, as has been recommended by Krishaber, and more recently by Verneuil. The tonsils and neighboring parts are first brushed over with a 10 to 20 per cent. solution of cocaine. The finest point of the thermocautery, heated to redness, is then inserted to a depth of about five millimetres in three or four spots a few millimetres apart from one another on the tonsils. The instrument is not allowed to remain more than one or two seconds in the tissue. The whole operation, including both tonsils, can be performed in a very few minutes without any bleeding, and with scarcely any pain. It must be repeated four or five times at intervals of two or three days, and this is usually sufficient to cause the tonsils to return to their ordinary condition.—*Lancet*, Feb. 16, 1889.

TREATMENT OF INGROWING TOE-NAIL.—DR. THEODOR CLEMENS, of Frankfort, strongly recommends the employment of tinfoil in the treatment of ingrowing toe-nail. He first has the toe thoroughly washed with soap and carefully dried. He then envelops the whole nail with

tinfoil, putting a strip between the portion that grows in, and the raw surface caused by it. The tinfoil is fixed by means of a very thin layer of common wax, and the patient told not to wash the part, but to use dry bran for rubbing off the dirt. Of course the toe has to be repeatedly dressed with tinfoil, but, if the operation is carefully performed, it is surprising how long the tinfoil will remain intact; even when the patient is, as was usually the case in Dr. Clemens' hospital practice, very poor and very badly shod. The results are stated to have been most satisfactory, and are ascribed by Dr. Clemens not merely to the mechanical action of the tinfoil, but to the effect of the permanent contact of a combination of metals comprising iron, copper, arsenic, molybdenum, wolfram, and bismuth, with a moist and growing portion of flesh. This, he says, brings about in a few weeks the complete healing of the sore, and causes the nail to grow more slowly, and in a more healthy manner.—*Lancet*, Feb. 16, 1889.

TREATMENT OF VALVULAR DISEASES OF THE HEART.—DR. DA COSTA in the course of a valuable and suggestive paper says: "From adonidine I have witnessed, in $\frac{1}{10}$ to $\frac{1}{5}$ grain doses three times a day, some admirable results; but more in cases of functional than of valvular diseases of the heart. Yet even here I have known it to act as an excellent heart regulator." Chloride of barium he finds both a general and a cardiac tonic, a remedy that increases the tone in the blood-vessels, a fairly good diuretic, and one that can be taken for a long time without disordering the stomach. He usually gives it in doses of $\frac{1}{10}$ grain three or four times daily; overdoses are apt to produce diarrhœa. It seems also to lessen cardiac pain." He finally says: "I must not bring this paper to a conclusion without mentioning a point of which I know the great value—to make periodical examinations of persons affected with valvular disease. I am not speaking of those in whom serious symptoms call for constant supervision; rather of those who, under our advice, take little or no medicine. In them, too, it is true that the heart of to-day may not be the heart of a month hence. Yet they are the ones chiefly in whom beginning changes can be most readily met, and whose lives, with the aid of treatment when necessary, can be greatly prolonged. Let them be made aware of the importance of skilled supervision. It will not mean needless interference; it will mean judgment as to when interference is really helpful.—*Amer. Journal of the Med. Sciences*, November, 1888.

NEW OPERATION FOR EMPYEMA.—PROFESSOR M. S. SUBBOTIN, of Kharkoff, describes in *Vrach* (No. 45) a new operation he has devised for opening the thoracic cavity in empyema, with the view of obviating the dangers arising in Estlander's operation and in the modifications of it practiced by Schede and Sprengel from the extensive raw surface which is necessarily allowed to remain in contact with the purulent discharge. The patient having been chloroformed, an incision was made along the seventh rib, which was then stripped of its periosteum and excised to the extent of 7 or 8 centimetres. An extensive opening was here made into the pleural cavity. After the pus had been evacuated the cavity was carefully cleansed and the opening well covered with gauze, and a gauze compress applied. An incision was then made along the border of the pectoralis major about 5 centimetres in length, exposing the sixth, fifth, and fourth ribs, and these were cut away (the periosteum not being left) with forceps until the rib became movable. Another incision was then made in the line of the posterior fold of the axilla, exposing the same ribs, which were again divided as before; the wounds were then sutured and dressed with gauze, a large thick pad of the same substance being applied outside, with a good compress bandage round the thorax. The upper wounds were kept from communication with the empyema. When after a few days the intrathoracic wound was dressed, a drainage tube was put in. The case recovered, but three months after the operation there was still a small sinus which continued to discharge. The advantages claimed by Professor Subbotin for his operation are the small raw surface which is left in contact with the purulent matter, and the firm but movable portion of the thoracic wall which can be pressed inward by bandaging, so as to diminish to a considerable extent the size of the cavity.—*Lancet*, Dec. 15, 1888.

NIGHT-TERROR AND SCREAMING IN A CHILD CURED BY REMOVAL OF THE TONSILS.—The patient, a boy, æt. 7, seemed to be quite well all day, but every night, after he had been asleep some little time, he used to wake up in a state of great terror. In a short time he got over the attacks, and would lie down to sleep again. He was examined, and nothing found except large hypertrophied tonsils. These were conjectured to be the cause of the symptoms. They were both removed. The child promptly got rid of his night-terror and screaming. It was presumed that in deep sleep, when he lay in some unfavorable position, the tonsils obstructed the respiration.—*The Lancet*, Oct. 6, 1888.

TREATMENT OF ERYSIPELAS.—DR. NOLTE reports that for several years he has had good results in the treatment of erysipelas with mucilage of acacia and carbolic acid (3 to 5 per cent.). The affected locality, and the adjacent skin, is painted over twice daily with the mixture, which is then allowed to dry.—*Therapeutische Monatshefte*, January, 1889.

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THE UNION OF MEDICAL SCHOOL AND UNIVERSITY.

Continuing the discussion of this subject, begun in THE JOURNAL of last week, it is proper to inquire as to the specific advantages belonging to the university system of medical education. In the first place, says Dr. Welch in his address, "this system may be expected to maintain the proper balance between purely technical training in the medical art and cultivation of the medical sciences upon which this training should be based, or to express the same idea perhaps more intelligibly. . . . between the practical and the scientific side of medicine." We would not give this particular advantage the first place, however. We should say, the *proper* union of medical schools with universities would insure that amount and degree of general education without which no one is fitted for the study of medicine. Under the term "general education" we would include *preliminary education for the study of medicine*. We believe the time will come, though our belief may be Utopian, when the medical schools will require as a condition of matriculation that each student shall have pursued a course of study looking to the study of medicine. The hope for this lies in the proper and true union of the medical school with the university; not a mere "affiliation," not a nominal connection, but an organic union.

The scientific branches of medicine receive too scant recognition and attention. "In a medical school permeated by the university spirit," says Dr. Welch, "and in intimate association with a university, these sciences cannot fail to receive proper recognition." Without wishing to appear unnecessarily critical, we would add to "the university spirit" the scientific spirit, which could scarcely fail to be engendered by a proper preliminary course to the study of medicine. How much more willingly, and how much more rationally would the medical student pursue his courses of human anatomy and histology if he studied them in the light that he has gained by a study of comparative anatomy, embryology, and biology! How much more intelligently would he study physiology if he were a physicist and chemist. "Physiologists," says Du Bois-Reymond, "should regard themselves as chemists and physicists who work only in a particular direction." Pathology requires the light of biology, physics, and chemistry. In a word, as was pointed out by Dr. Gairdner in his Presidential address before the British Medical Association last year, and aptly illustrated by Dr. Clifford Allbutt in his address in medicine, the true physician must be and is a naturalist—a *Naturforscher*—and this no one can be who neglects the necessary educational basis of a naturalist. "Universities," says Dr. Welch, "have always kept alive the ideal that the interests of life are not wholly material, but that they are spiritual and intellectual as well. May the time never come when this ideal shall be replaced by the estimate of knowledge, solely for its commercial value, or its immediate application to the practical necessities of life. Somewhat of this true university spirit should pervade medical study, if the practice of medicine is to be a profession and not a trade or a handicraft."

Dr. Welch then goes on to speak of the scientific spirit that would be engendered in a university medical school of the character indicated. While it is not claimed that the desired results are possible only in a medical school in a university, it must be admitted that the atmosphere of a university is particularly favorable, and that of an independent medical school unfavorable for their attainment.

Few university men, or thinking men, will take issue with Dr. Welch in his opinion that the last two years of a medical course should be given mainly to the study of the practical branches of medicine; and this study should be more practical

and demonstrative than it is at present. In speaking thus the two-course schools are left out of consideration, as they should be out of existence. A shorter period of medical study than four years seems to Dr. Welch possible only with a preliminary medical training such as is already furnished with excellent results in some of our universities, and with a supplementary experience in a hospital.

Still another benefit to be derived from the proper union of medical school and university is the encouragement of research, which naturally follows the existence of the scientific spirit. With this spirit, and with well-equipped laboratories, workers will be abundant, the university will win renown, and medical science will make progress. There will be workers here, as in other countries, that seek the truth for its own sake, whenever and wherever it can be found, without regard to its immediate practical value. Medicine offers all the attractions and fascinations of a natural science; all that we need to make workers and to encourage research is the scientific spirit, and laboratory facilities. "When America does wake up to the necessity of these things," said a distinguished German physiologist, "then let Europe look to her laurels." America will wake up to the necessity of these things when the general public better understands the cost of sickness and the money-value of health.

A very practical advantage in making a medical school a department of a university is economy of organization. "A university provides for the study of certain subjects which either are included in a medical course, or should be required in a course preliminary to the study of medicine. The most important of these subjects are chemistry, physics, botany, zoology, and comparative anatomy." In the medical schools of this country chemistry is the only one of these sciences that has any place in the curriculum, and even this is an unsatisfactory feature, physiological chemistry being generally altogether ignored. As the matter now stands, organic and inorganic chemistry, which should be entirely acquired in the preliminary course, are the only branches of the science taught, in the medical schools.

ENLARGED TONSILS AND THORACIC DEFORMITY.

It is now a well-recognized fact that certain cases of hypertrophy of the tonsils are accompanied by a special deformity of the chest, at a point corresponding exactly with the union of the inferior and middle third of the chest-wall. This deformity, first noticed by Dupuytren, is the subject of an interesting paper by M. BILHAUT, in the *Annales d' Orthopédie et de Chirurgie pratiques*, No. 6, 1889. The deformity was at first attributed to rachitism. Further study of the subject, especially by Coulson, of London, and Mason Warren, of Boston, showed that there was more than one chest-deformity present in cases of hypertrophy of the tonsils. Two distinct classes were differentiated: in the first are placed the rachitic deviations in subjects of enlarged tonsils; the second class comprises those cases only in which the thoracic deformity is essentially due to tonsilar hypertrophy. It is the second class that M. Bilhaut discusses.

Lambron not only described this deformity, but he differentiated the analogous lesions, and indicated the most rational treatment. "The ribs forming the median part of the thoracic walls are more or less depressed or sunken, so that these bony arches present an incurvation opposed to their natural curvature, and the maximum of this incurvation corresponds almost exactly to the middle points of the bones. As a rule, the upper part of the chest is not involved by the deformity, but retains its normal form, and, if it appears more convex, if the ribs appear to be more prominent, and more curved outward, it is, in most cases, due to the contrast between the natural curvature of the upper, and the unnatural depression of the median ribs. The condition of the sternum is in perfect accord with that of the costal walls; it is markedly sunken at the union of its middle and lower third, but for the remainder of its extent preserves almost exactly its normal form. The incurvation of its lower part gives the appearance, by contrast, of its upper part being much more prominent than normal." The existence of this deformity does not exclude those of a different nature, such as scoliosis, kyphosis, Pott's disease, etc., and one of these lesions may be found in a patient with the thoracic deformity due to tonsilar hypertrophy.

One of the most notable contributions to the

literature of this subject is a *Thèse* sustained before the Faculté de Médecine in 1881, by Dr. Gaillard, of Chaton. This *Thèse* was the outcome of a most careful study of the etiology, symptomatology and treatment of this affection. He called special attention to the lateral flattening of the thorax and the projection of the sternum, giving the "pigeon breast." The difference between this alteration of the thorax and that due to rachitism is marked. In rickets the costo-sternal cartilages form a projection, and two *vertical* grooves extend from above downwards along the chest. The groove caused by tonsilar hypertrophy, however, is transverse, giving somewhat the appearance of a ligature having been maintained for a long time at the junction of the lower and middle third of the thorax. Alphonse Robart explains this deformity by a diminution of intrathoracic tension, the result, he claims, of impeded entrance of air. The narrowness of the upper air-passages impedes the entrance of air, while atmospheric pressure, being not compensated, causes the deformity of the flexible chest-walls of the young subjects. Bilhaut regards this theory as indefensible, and is inclined to adopt that of Lambron, who says, in regard to Robart's theory that atmospheric pressure should act in the same manner on all points of the thorax, and not on a limited portion. Lambron attributes the deformity to forced diaphragmatic respiration; and as a matter of fact the line of deformity is the line of insertion of the diaphragm. Yet it may be asked why a similar deformity is not found in emphysematous and asthmatic persons?

The first thing to be done in the way of treatment is to remove the enlarged tonsils, partly or wholly. If the deformity is sufficiently marked to require orthopædic treatment, Bilhaut advises corsets that exercise slight pressure on the broader portion of the chest. Sayre's plaster jacket may be used, says Billhaut, but preference should be given to a laced corset. At the point of greatest circumference a layer of wadding or soft-rubber cushions may be placed. In very young children a simple corset will be sufficient as a rule. Massage and frictions should be utilized. It is useless to begin any method of orthopædic treatment, however, until the hypertrophy of the tonsils has been reduced or removed.

EDITORIAL NOTES.

Dr. John Swinburne died at his residence in Albany, N. Y., on March 28, 1889, aged 69 years. He had long been one of the most eminent members of the profession in that city. He had, at different times, filled the offices of Health Officer of the Port of New York, Member of Congress, and Mayor of Albany.

Dr. R. L. Howard, of Montreal, Canada, died on the 28th of March, 1889. He was Dean of the Faculty of Medicine in McGill University, and well known as a leading member of the profession.

Colchicine in Ocular Therapeutics.—At the meeting of the Société d'Ophthalmologie of Paris on February 5, M. Darier said that since the discovery of salicylate of soda many ocular affections have been regarded as of rheumatismal nature, and have been much benefited by this agent. This drug has been shown to be of great efficacy in cases of marginal corneal ulcers of arthritic nature, in certain cases of iritis, and in simple episcleritis, however intense, so long as the sclerotic tissue is not seriously involved and the cornea is not infiltrated. In the cases of sclerotitis with corneal complication, as well as in certain grave forms of serous iritis and of anterior sclero-choroiditis, neither salicylate of soda in large doses, nor salicylate of lithium show any efficacy. But with colchicine in doses of 2 or 4 millig. a day, says Darier, excellent results are obtained. In persons of gouty and rheumatic history colchicine is of signal value, especially in chronic and severe cases in which salicylate of soda has no effect. A patient with simple episcleritis may be cured easily by the salicylate, but if there is sclerotitis, with sclerosing keratitis, 2 to 4 millig. of colchicine should be given with the salicylate. In patients with hereditary accidents, and in whom the sclerotitis is the first manifestation of the arthritic diathesis, colchicine may be advantageously combined with benzoate of soda or lithia, or with carbonate of lithia, says Darier, if the antecedents are unmistakably gouty. It appears, however, that urate of lithium would be much better than the carbonate, which is a very insoluble compound in the animal fluids. Colchicine may be prescribed in the form of granules of one millig. each. One, two, four, and even six may be taken in one day, the patient

being instructed to lessen the dose when symptoms of colic occur. But no preparation of colchicum is well borne for any considerable length of time.

REVISION OF THE UNITED STATES PHARMACOPŒIA.—We desire to direct the attention of all parties interested in the proper revision of the Pharmacopœia for 1890, to the official call for the *General Convention* of revision, found under the head of miscellaneous notices in the present number of THE JOURNAL. The Convention is to assemble in Washington, D. C., at noon, May 7th, 1890. "Every incorporated medical or pharmacal college, association, or society desiring to be represented in the Convention," should send to Robert Amory, care of Dr. Edwin N. Brigham, 19 Boylston Place, Boston, Mass., its corporate title and a list of its officers. For further information see the call in another column.

THE BUFFALO COUNTY (NEB.) MEDICAL SOCIETY has been recently organized, with the following officers: Dr. G. L. Humphrey, President; Dr. J. J. Porter, Vice-President; Dr. F. H. Duckworth, Secretary.

NURSING INFANTS WITH ASSES' MILK.—The public charities of Paris, says the *Scientific American*, under the advice of the physicians have substituted for the milk of goats that of asses, and have installed an ample yard near the pavilion of the rickety and scrofulous children, which is separated only by a short covered passage-way. A very picturesque scene is the spectacle of the lactation of the infants in this enclosure every morning. The women that have charge of the animals hold the children in such position that they can suckle the docile animals, which they do with avidity. The administration d' Assistance Publique has calculated that one young ass is able to lactate abundantly for nine or ten months.

ASSOCIATION NEWS.

American Medical Association. Fortieth Annual Meeting.

To be held in Newport, R. I., June 25, 26, 27 and 28, 1889.

SECTION ON STATE MEDICINE.

The following additional papers have been announced for presentation to the Section on State Medicine at the forthcoming meeting of the Association:

"The Necessity for Sanitary Supervision of Schools," Dr. George H. Rohé, Baltimore, Md.

"The Purification of Drinking Water for Cities," Dr. Charles V. Chapin, Providence, R. I.

A Paper, by Dr. A. N. Bell, Brooklyn, N. Y.

It is requested that gentlemen who have promised papers for this Section and have not designated the titles thereof, will send the titles to the Secretary as soon as possible,

In order to systematize the work of the Section, it would be a favor to have the names of gentlemen that desire to discuss any of the papers to be read before the Section.

S. T. ARMSTRONG,
Secretary of Section on State Medicine.
U. S. Marine-Hospital Service, New York, N. Y.

SECTION ON LARYNGOLOGY AND OTOLOGY.

The Secretary of this Section has written to about 200 of the best known laryngologists and otologists in the country, a number of whom have promised papers for the June meeting, so that the officers can assure the profession of a successful and highly interesting meeting.

Some who were uncertain as to whether or not they could find the time to write are now urged to definitely decide, and it is hoped that some who felt it impossible to do anything, will change their minds, and make an extra effort for this meeting. The few who have not replied to the Secretary's personal letter are earnestly requested to do so at once.

Titles of articles should be sent in as soon as the authors have decided upon their subject.

E. FLETCHER INGALS, Secretary,
70 State St., Chicago.

W. H. DALY, President,
Pittsburgh, Pa.

The names and addresses of Section Officers and other officers of the Association are printed on advertising page 25.

Special Attention is called to the following Rules of the Association:

It shall be the duty of every member of the Association who proposes to present a paper or report to any one of the Sections, to forward either the paper, or a *title* indicative of its contents, and its *length*, to the Chairman of the Committee of Arrangements at least one month before the annual meeting at which the paper or report is to be read. It shall also be the duty of the Chairman and Secretary of each Section to communicate the same information to the Chairman of the Committee of Arrangements concerning such papers and reports as may come into their

possession or knowledge for their respective Sections, the same length of time before the annual meeting. And the Committee of Arrangements shall determine the order of reading or presentation of all such papers, and announce the same in the form of a programme for the use of all members attending the annual meeting. Such programme shall also contain the rules specified in the By-laws and Ordinances concerning the consideration and disposal of all papers in the Sections.

No report or other paper shall be entitled to publication in the volume for the year in which it shall be presented to the Association, unless it be placed in the hands of the Committee of Publication on or before the first day of July. It must also be so prepared as to require no material alteration or addition at the hands of its author.

Every paper or address received by this Association, or by a Section, and ordered to be published, and all reports of Committees, and all plates or other means of illustration, shall be considered the exclusive property of the Association, and shall be published and sold for the exclusive benefit of the Association.

ORDINANCES.

Resolved, That the several Sections of this Association be requested, in the future, to refer no papers or reports to the Committee of Publication, except such as can be fairly classed under one of the three following heads, namely: 1. Such as may contain and establish *positively* new facts, modes of practice, or principles of real value. 2. Such as may contain the results of well-devised original experimental researches. 3. Such as present so complete a review of the facts on any particular subject as to enable the writer to deduce therefrom legitimate conclusions of importance.

Resolved, That the several Sections be requested, in the future, to refer all such papers as may be presented to them for examination by this Association, that contain matter of more or less value, and yet cannot be fairly ranked under either of the heads mentioned in the foregoing resolution, back to their authors with the recommendation that they be published in such regular medical periodicals as said authors may select, with the privilege of placing at the head of such papers, "Read to the Section of the American Medical Association on the day of 18 ." (Vide *Transactions*, vol. xvi, p. 40.)

Resolved, That no report or other paper shall be presented to this Association unless it be so prepared that it can be put at once into the hands of the Permanent Secretary, to be transmitted to the Committee of Publication. (Vide *Transactions*, vol xvii, p. 27.)

SOCIETY PROCEEDINGS.

Massachusetts Medical Society, Suffolk District.

Stated Meeting January 9, 1889.

SECTION FOR CLINICAL MEDICINE, PATHOLOGY AND HYGIENE

ALBERT N. BLODGETT, M.D., SECRETARY.

DR. HENRY JACKSON read a paper entitled

NOTES ON TWENTY-SEVEN CASES OF DIPHTHERIA, OCCURRING BETWEEN JULY 1, 1888, AND JANUARY 1, 1889.

(See page 482.)

DR. A. L. MASON opened a discussion on diphtheria with a report of 6 fatal cases of that disease in adults which had recently occurred in the new diphtheria ward at the Boston City Hospital. This ward, which was opened in April, 1888, was stated to be admirably adapted to its purpose, and the nursing was, in the experience of the reader, unequalled, because he knew of no other hospital in this vicinity where the nurses are systematically trained to take care of large numbers of diphtheria patients, a duty which they perform with the greatest intelligence and devotion. Under these favorable conditions for treatment, however, the mortality had been large, many patients, both adults and children, dying from septic poisoning, heart failure in convalescence, and tracheal obstructions. Their state at entrance was often very bad, sometimes moribund. Almost all cases admitted would be classed as severe.

Dr. Mason continued as follows: It will be well, then, to consider how fast this disease has grown upon us, from a few isolated cases thirty years ago, until it is now the most fatal endemic disease of a preventable nature which we have to contend with. The success of our board of health with smallpox makes it proper to assume that the mortality from all infectious diseases could be reduced to a minimum if similar methods could be adopted for their suppression. In this connection I will refer to the report of the Glasgow Fever Hospital, where by isolation and disinfection an improvement in the public health has been obtained.

There are obvious reasons why it is difficult to deal with diphtheria in this community, at present at least, in as summary a manner as with smallpox, although diphtheria is much less contagious, therefore more readily controlled; it is also more fatal, and in many cases it is entirely beyond the reach of medical or surgical aid.

During 1888 the number of deaths from diphtheria in Boston was 470, one third of all the cases reported. This is in excess of the whole number of deaths from yellow fever in Florida

during the recent epidemic, in which there were about 350 deaths in less than 4000 cases, 9 per cent.

At the City hospital, with the assistance of Dr. W. A. Morrison, house-physician, I have found that the records of the diphtheria wards show in 1888 the admission of 199 medical patients and 126 surgical; total, 325; 34 cases were transferred from the medical to the surgical department for operation on account of tracheal obstruction. It will be seen, then, that 160 patients, or nearly half the whole number admitted, required surgical treatment. Of the remaining 165, who were treated medically, 47 died, or 28 per cent. Under 15 years of age, there were 145 admissions with 40 deaths, 27 per cent. Between 15 and 30 years, 6 deaths out of 49 cases, 12 per cent. There were but five patients over 30 years of age, viz., one of 30, one of 31, two of 34, and one of 40 years. One died from tracheal obstruction which was not relieved by tracheotomy.

Direct contagion was reported in about one-fifth of the admissions, but the history in this respect is often deficient. Many of the worst cases come from among the Germans, Poles, Italians, and other foreigners. Two cases came from the same family in six instances; 3 cases, three times; 4 cases, three times; 5 cases, once. Thirty-eight cases from thirteen families.

Among the inmates of the hospital who took the disease were, one of the house-physicians, as previously mentioned, who died after a brief illness; three nurses employed in the diphtheria wards; one nurse in a distant ward; and one laundry maid; all of whom recovered.

In 1880, when the facilities for isolation were imperfect, there were but 71 admissions to the medical department, of whom 7 were hospital employés; 22 per cent. of cases died. In 1887 the rate of mortality, exclusive of surgical cases, was 29 per cent.

It is probable that a large proportion of the gravest cases occurring in the city come to the hospital, especially for tracheotomy. This necessarily makes a high death-rate; 47 per cent. out of a total of all cases admitted in 1887, 184 in number.

DR. G. H. LYMAN said the number of cases of diphtheria has certainly been very startling at the City Hospital, and they presented some features unlike those I have observed in former years. Since October 1st I think there have been under my service 30 cases; 8 of these were transferred for operation, leaving 22 cases, of whom 4 died. There has been another feature in connection with these cases that, I think, has been very striking, and that is the very weak pulse and the low condition of the patient in almost all the cases that I have noticed, certainly in a very large number. Out of these 22 cases there were 4 of distinct heart failure. One of them recovered; the other three died, and died apparently from a paralysis of the heart; it was not thrombosis; they died easily, quite suddenly; there was no considerable effort required for breathing, no sudden excitement towards the last, which, I suppose, we should look for in cases of thrombosis. With the exception of these cardiac failures there have been none of the cases followed by any symptoms of paralysis elsewhere. In cases of typhoid fever we have had quite a number of patients recover apparently entirely from the typhoid, but we found several of them suffering from neuritis. I have half a dozen cases of neuritis following typhoid fever, but none following diphtheria.

The great prevalence of the disease, it seems to me, is a thing to which prompt attention should be given. I cannot think, in view of the statistics of the Glasgow Hospital Report, that it is a necessary disease. It seems to me something could be done to check it. We can check smallpox; Glasgow people seem to be able to check diphtheria. I see no reason why we cannot do it here as well. The Boston City Hospital has accommodation for twenty-five to thirty diphtheria patients. For a portion of the time the ward has been fairly full, I don't think so full that any cases have been obliged to be placed elsewhere.

The cases Dr. Jackson speaks of, of mild diphtheria or, granting a doubtful diagnosis, follicular tonsillitis, have been quite numerous. We have had a good many cases in which, for twenty-four hours, we did not attempt to make a positive diagnosis. There seems to have been a more constant accompaniment of tonsilar inflammation, distinct from diphtheritic disease, than I have ever noticed before. A good many have turned out to be tonsilitis, but some of them undoubtedly were diphtheria.

The importance of the thing, it seems to me, me, must be manifest to this Society, but I do not know how we are going to remedy it except through some action of the Board of Health. I think the subject is important enough for this Society to appoint a committee to consult with the Board of Health to see if there is not something to be done to check the spread of this disease. Dr. Jackson mentioned one point that was confirmatory of the general views on the subject; that the disease was decidedly infectious, and *not* contagious. I have always supposed that to be the case, but his statistics and those which the chairman has given bear out my opinion very strongly.

I am rather surprised at the great mortality that the statistics which have been presented give. I did not suppose, from my experience on the medical side of the hospital, that it was anything like that. I suppose the cases turned over to the surgical side were transferred too late, or were of such a character that no operation would relieve the patient. This would increase the general

mortality very much. The operation in a large number of surgical cases—cases extending to the larynx and requiring operation—is done in patients already reduced by the disease, and the mortality is very large indeed. Putting those aside I should say the mortality of diphtheria was small.

DR. DURGIN, Chairman of the City Board of Health: The appointment of a committee would please me very much. I have listened to the remarks with a good deal of interest, and I felt very greatly pleased when I understood that there was to be a portion of this evening taken up with the discussion of the prevalence of diphtheria in Boston. The cause of such a large number being treated at the City Hospital has already been given by the reader. The accommodations have been greatly increased in the past year and, in addition to that, the Board of Health have taken measures to send more patients there than ever before, in consequence of the increased accommodations. I have been somewhat surprised at the very large rate of mortality at the hospital, which undoubtedly is accounted for in a large measure by the fact that the *worst cases* come there; not all, but many of the worst cases, and particularly the surgical cases. The mortality for the whole city, however, has not increased this year; that is, the rate of mortality, the average percentage of mortality of the whole number of cases reported. I have brought in a transcript from the records to show the percentage of mortality of the number of cases reported for the last eleven years; that is, during the period over which we have called for reports from the physicians. I find that the percentage of deaths from diphtheria of the total numbers of cases reported for the past year was 33.18 per cent., and for the past five years the percentage has been 29.16 per cent. against 33.56 per cent. for the previous five years; there having been, as you see, quite a reduction in the percentage of deaths in the total number of cases reported in the last five years compared with the previous five years.

In 1878 we called for reports upon diphtheria, and the first year we received 1,370 reports, with 448 deaths, giving a percentage of 32.7 per cent. for the deaths. For the first five years there were 7,363 cases, and in the last five years 6,134. I wanted to say in this connection that the difference between the official treatment of diphtheria as contrasted with small-pox is certainly very great. In small-pox we have older people to deal with; the average age is considerably higher than with diphtheria, there is therefore less trouble in separating children from parents. In small-pox there is very great fear of the contagion; with diphtheria it is not as great. People will expose themselves and allow others to expose themselves to the one when they would avoid the other. A still greater difference between the two diseases is in the matter of diagnosis. In small-pox it is very easy, and is almost always made at a very early stage. The physician either recognizes the disease himself at once, or calls an expert to make the diagnosis. In diphtheria it is not so. In diphtheria there is, as we know, oftentimes great difficulty in making a positive diagnosis. The child remains under suspicion for several days if not weeks, therefore the report to the Board of Health is delayed, sometimes until the child has died, and allows the consequent exposure more or less of other children to this disease, both to the family and to people who are liable to call at the house. Another difficulty in the way of treating diphtheria is the difference of opinion in the profession in regard to the true character of croup. There is a question in the Society as to whether croup and diphtheria are one and the same disease, and so long as that difference of opinion exists, so long we shall have a large number of cases of a contagious disease, call it what you may, that will spread from one person to another, and cause croup in our community. The cases are numerous where the disease has spread from one person to another in a family, and beyond the family, while the physician has persisted in calling it croup, and therefore not contagious. Another difficulty which stands in the way of successful treatment by isolation of diphtheria is the fact that in Boston we have no adequate hospital accommodation, notwithstanding the fact that the city has been somewhat generous in providing greater facilities in the past year; and the accommodations, I trust, have not been used to their utmost capacity yet; still, we are constantly running across families where it is almost impossible to separate the children from the parents, or from each other, and the patient remains at home, and thus we constantly have a very large number of points of infection through the city, which never exist with small-pox, and which we cannot overcome. It becomes absolutely necessary, if we would treat diphtheria as we do small-pox. that the Board of Health shall have some place to quarantine such a family, in order to disinfect the house. Again, with small-pox, we have the great advantage of vaccination, which cannot be overrated. There are, in spite of the best we can do, some insurmountable obstacles in the way of treating diphtheria and reducing its prevalence in our city as we might do with small-pox.

DR. GEORGE B. SHATTUCK: We are very grateful to Dr. Mason for bringing before us such a practical subject in such a practical way; and it is only by discussing such a subject in meeting, as we are doing to-night, that we can make some approaches towards creating precisely that public opinion which Dr. Durgin appeals to as necessary for the support of an executive body like the Board of Health; for it is very certain that a Board of Health is limited in its action, first of all by the

powers which the laws give it, and secondly, beyond that, by the condition of public opinion even where the laws support it in active procedures; and our expectations in regard to what the Board of Health can do must be controlled, even beyond and outside of what the laws allow, by the condition of public opinion, which limits what the Board of Health can practically accomplish. I think there is a great deal in the point Dr. Durgin has made with reference to the difference between diphtheria and small-pox. There is an utterly different feeling in the community with reference to small-pox, and one comes across it in all sorts of ways. I remember in a trial in court with reference to typhoid fever, it was perfectly simple to convince the jury and the judge that you could not have a case of small-pox without a preceding case, but as soon as we attempted to tell them they could not have a case of typhoid fever without a preceding case, that seemed to them very extraordinary, a very singular theory indeed, and they immediately wanted to know, if that was so, where the first case came from. With reference to small-pox that difficulty never came to their minds. The public does not reason about these diseases, and you can't do with reference to diphtheria what you do with reference to small-pox.

There is the question of diagnosis. Among some of our brethren who practice medicine, and especially sectarian medicine, a single individual may have three or four hundred cases of diphtheria in his practice in the course of a year, and of this probably the mortality will be absolutely nothing. I remember such an instance not long ago in Springfield, where a distinguished sectarian practitioner described to a society how he had had several hundred cases of diphtheria in the course of the preceding year without any deaths whatever. One of the society, who had taken pains to look up the returns at the registrar's office, showed him and the society that he was mistaken in regard to this. But, of course, the question of diagnosis is a very difficult one, and cases may be returned as diphtheria which are not diphtheria, and, on the other hand, it is perfectly easy to conceal such a disease as diphtheria, which has not any external manifestations. Whilst acknowledging all that, I still sympathize with the feelings which the chairman has expressed; and I think any one on duty at the City Hospital, where we have certainly an opportunity to see as much genuine and serious diphtheria as any other practitioners in this community, if not more, could not help wishing that something could be done. In some cases you cannot force patients to be isolated. I remember one of those unfortunate instances in which almost the whole family —the mother, a child at the breast, and two or three young children—were all brought to the hospital with diphtheria, and one of the children, I think, died; the father came and took the rest of the family away and took them home against every remonstrance. It does seem as though such a thing as that ought not to be allowed to occur. The father took them back to the same house in which diphtheria had occurred a certain length of time before they had inhabited it, and he took them back there because, he said, he couldn't go anywhere else. He made an effort to get other lodgings, and it was known his family had had diphtheria, and he was driven back to the same lodgings. Such things are constantly presenting themselves to our attention and necessarily make us desire, if possible, that something might be done.

With reference to the mortality at the City Hospital, I don't think it is a large mortality, as mortality from diphtheria is recognized. I think that the statistics of the text-books and of other hospitals will show that the mortality is expected to range rather above 30 per cent. than below it. Many of the cases at the City Hospital are not only the worst cases, but are also, many of them, in the worst possible condition; and I think that it is rather surprising that under these circumstances the mortality should be as small as it is. Without going into the question of treatment I should like to say that, for many years, I have felt that the fact that the mortality has been kept at the point where it is has been largely owing to the extremely skilful and faithful nursing which these patients receive at the City Hospital. I don't believe that that class of diphtheria cases would stand anything like as good a chance anywhere else under other circumstances, and for such cases as these, whilst it is important to have a sensible and experienced physician, I cannot help feeling that it is of fully equal importance to have an intelligent, and faithful, and devoted nurse, who is always on hand to carry out the minutest directions in the most prompt, and regular, and efficient fashion.

DR. G. H. M. ROWE, Superintendent of Boston City Hospital: This is a subject in which I am much interested, as it involves so much experience in regard to the care of the patients with diphtheria at the City Hospital. The Board of Health for several years have appealed to us for greater facilities for the care of patients with contagious diseases. The same thing has been done in the City Hospital Report, in the Trustees' Report, and in the Superintendent's Report, for at least seven years previous to the time when we received our appropriation. Formerly these patients were taken care of in the mixed wards called K and L. The mortality was thought then to be large. The number of nurses who contracted diphtheria was very much larger then than it has been since the new wards were erected. It was only by publishing openly in the City Council the fact that patients had come in there with one disease and contracted another—nine cases in one winter, of whom

four died—that the appropriation was gained. I think it is an open question whether diphtheria wards should be attached to a city hospital; but it was Hobson's choice at that time. The Glasgow Hospital, which has been alluded to by Dr. Mason, is, as far as my knowledge goes, the finest hospital in the world, and the regulations for the separation and isolation of contagious diseases are the best I know of—rules we are not able to enforce at the City Hospital. Our new wards, of course, were experimental in a large measure, but experiments have proved that they are eminently successful in heating and ventilation. There is one fault that could be remedied, and that is that the fresh air supply is not equal to the exit. The system of ventilation is such that fetid odors are carried off rapidly. The accommodations have never been filled to their utmost capacity. We have accommodations for forty-two patients with diphtheria. At no time have there been more than twenty-seven, and it is rare that there are above twenty-two. In previous years the Board of Health has been clamoring for a place to carry these patients. The city government through its Council has supplied such a place, and yet it appears from statistics which are well known to the gentlemen connected with the hospital, that the mortality this year has been something that is, I may say, alarming. It is so much so, and recognized at the hospital to such a degree, that the nurses, although very anxious to see the result of the experiment, become depressed after they get into these wards, and are glad to be relieved and sent elsewhere. They work with the utmost faithfulness, and yet, patients who seem to be doing well often die suddenly from septic symptoms or heart failure. That has a very depressing influence upon the nurses. During the last week in November Dr. Prescott made some statistics. They are not made with reference to publication. They are very nearly the same as those by Dr. Mason. The total number of patients with diphtheria admitted this year was 337. Dr. Mason has given the statistics of the patients admitted on the medical side. I have those who were admitted on the surgical side up to about the 5th or 6th of December. To that date the total cases admitted on the surgical side was 139. Out of that number the deaths were as follows: Tracheotomy was done in 35; of that number 5 recovered and 30 died. Intubations, 71; 54 died and 17 recovered. By another classification, of those cases on whom intubation was first done and subsequently tracheotomy, comprising 16 cases, all died. Out of 17 cases on whom no operation was done, for various reasons, mostly because they were septic and operation deemed useless, 4 recovered and 13 died. That makes a total of 87 deaths. The total deaths were 53 per cent. at that time. The total admissions to the City Hospital in five years have been 960; in four out of five years 333 cases have died. When the new wards were opened I sent a communication to the trustees recommending certain rules in regard to the isolation of the cases and to the limitation of visitors. It was decided that the practice of admitting friends should go on in a tentative way, and the attempt be made to limit them as far as possible. Practice has shown that what Dr. Durgin says holds true; it is almost impossible to shut out the parents from their children; and if any attempt of that sort is made they immediately take their child away. Our invariable rule is that patients with tracheotomies and intubations are considered as *dangerously* ill. The parents are admitted at all times before 8 o'clock in the evening. We are practically able to exclude all friends except the parents, but beyond that it is very difficult to go in wards attached to the hospital; it is only possible when we have them isolated and separated. The only way to bring this about has been intimated by Drs. Lyman, Shattuck, and others, and that is the creation of public opinion. If the Board of Health cannot do it by its rules and regulations and by expression of opinion through their published reports, and in various other ways; if the City Hospital through its annual report and that of the Superintendent and Trustees are not able to accomplish it, the only way out of it would seem to be that the profession, through its societies, in some formal way should try to educate the people to a better state of public opinion.

A conference with the board of health has been suggested. Until public opinion is created so that it shall influence the uneducated classes, and until some such legal restrictions are made for diphtheria as for smallpox, it seems to me impossible to stop it; when that period is reached it seems to me that a great deal will be accomplishd in reducing the mortality, and also in reducing the amount of disease. At the present time there are 18 or 19 cases of diphtheria at the City Hospital. The ward for scarlet fever has been closed, with the exception of 2 cases for nearly three months.

Dr. C. F. Withington: My experience of diphtheria, so far as hospital work is concerned, is limited to the out-patient department of the City Hospital; and I am sorry to say that patients with diphtheria come there, and it is not an infrequent occurrence to find, in looking over the patients in the morning, that a patient with diphtheria has been sitting in immediate contact with other patients in the waiting-room. That, I suppose, is not peculiar to the City hospital out-patient department. The same necessarily must happen more or less in all outside clinics. It is to be hoped that when the new building is completed at the City Hospital some opportunities will be found to question patients at least sufficiently to indicate the possible existence, not only of diphtheria, but of other eruptive diseases, so that these

patients can be removed from contact with the others.

A question which has been of a good of deal of interest to me of late has been with reference to the comparative frequency of diphtheria in the various wards of the city. I would like to know if the records at the board of health's office show the distribution as to the wards of the city, because, it seems to me, that it is a matter of considerable importance. It is generally assumed that a great deal of the diphtheria comes from the North End districts, and other more crowded portions of the city. In Roxbury there is considerable prevalence of diphtheria for the last year. One of the cases reported—Case 3—I saw before she entered the hospital. Her surroundings were certainly not such as to give any clue to the origin of the disease in her case. In one house in that district, apparently in perfect sanitary condition, a well-built, large house, in 1876 there was a case of diphtheria in a woman of 60 or upwards, who died. The family then moved away. Two years later a young woman was confined in the house and died of puerperal fever. Her servant went home with a sore throat, which was serious, and whether she recovered from it I do not know. A sister of the lady sick with puerperal fever went home and developed typhoid fever; she was seriously ill. Another family took the house for a year or two, and in 1880 another case of diphtheria occurred in the same house in a child.

Last summer a lecture was published in the Boston *Medical Journal* in regard to the relative frequency of diphtheria in urban and surburban communities. The conclusion was drawn from some fifty different outbreaks of diphtheria, mostly in surburban communities, that in a pretty large number of cases of diphtheria it was impossible to trace the first case of the epidemic from a previous case. In only four out of fifty could the writer trace the first case from a previous case of diphtheria, and he was inclined to believe that a certain number of cases of diphtheria may develop from general insanitary conditions, possibly irrespective of a specific contagion from a previous case. That evidence was tolerably strong in his cases. He cites a number of parishes of over 1000 inhabitants which had a small number of cases of diphtheria in this period of years, while in another series of smaller parishes the frequency of outbreaks were proportionately large. The figures he gives seem to me not to be borne out altogether by the figures in this country, so far as I have been able to ascertain. The last monthly report of the New York State Board of Health, for instance, gives the frequency of the deaths from diphtheria for the month of November, 1888, in the different districts of the State, and of course the mortality by direct conveyance of disease from one to another would naturally be expected to be greater in the cities, but in spite of the fact that treatment is more active there than in the country districts, the preponderance was greater in cities like Brooklyn, and Albany, and Troy, than in the back-country districts; whereas the report of Dr. Barnes just referred to gives a much larger number of occurrences in the remote districts than in the larger cities. I should like particularly to know whether the occurrence of diphtheria is very much greater in the wards in this city which approximate more nearly the country conditions than in the more crowded wards, or the reverse.

DR. DURGIN: I cannot reply with exactness; but in the past year the distribution has been scattered over the entire city much more than in any previous years. As a matter of guess-work, I believe that the percentage of cases of diphtheria in the population of the out-lying districts is rather greater than that in the more densely populated parts of the city. I think that Dr. McCollom could give a better opinion upon that subject than I, because he sees more of the cases. Dr. McCollom and his assistants usually see most of the cases, particularly those in the central part of the city.

I would like to call attention to one or two points in relation to this disease, and one is the repetition of the disease in the same patient. The text-books, I think, say that one attack seems to predispose the patient to subsequent attacks. Although my own personal experience has not been a large one, this statement of the text-books has not been borne out by my observation; and I have fallen in with very few physicians who have found that that was true. We occasionally hear a patient say that she or he has had diphtheria several times before. Of course that is partial evidence. I know that some physicians have seen a second and perhaps a third attack in the same patient. Of course, if this is largely true, it gives us a much less advantage in taking care of diphtheria than in taking care of most of the other contagious diseases. I should be glad to hear expressions of others who have had experience with diphtheria, on that point.

The matter of removing a patient with diphtheria from the City Hospital is a serious one; legally, I think, neither the trustees nor the board of health would have the right to retain such a patient contrary to his desire.

DR. ROWE: Of course we adapt our policy to the class of people we have to deal with. In a large number of cases we have dissuaded them from removing patients with this disease. In all cases where such patients remove them they are discharged as going on their own request and against advice. We have a printed form for such cases and at the end we state that they remove their child or friend, knowing the disease to be diphtheria and dangerous both to the patient and the public, and they take the entire re-

sponsibility, freeing the hospital and its physicians and the authorities from all responsibility. There is a certain more ignorant class to whom we say, "It is impossible to take your child away." We say it to the Poles and Huns. "You cannot do it without permit from the board of health." If we should make it a test case, there might not be sufficient power with the board of trustees to retain a given case. If patients are taken from the City Hospital, it should be understood that it is not done until after measures are used some, of which are fair and some perhaps not quite truthful, with the more ignorant classes, to retain them.

DR. G. B. SHATTUCK: I should be sorry if any gentleman present got the idea from anything I said, that I supposed, or meant to indicate that there was any power vested in the City Hospital or its board of trustees to prevent such an occurrence. I cited the occurrence to indicate to the society the position of public opinion, and the difficulties in dealing with this question, where such a thing as this was possible and legal, and could be done, and could not be prevented; and it is exactly one of those points which we want to educate public opinion to deal with, and to stimulate our lawmakers to make laws with regard to. With reference to the family I cited, the father there was a very independent, intelligent New Englander. If he had been a Pole or Polish Jew, or German or Austrian, then, as Dr. Rowe says, there would have been some hope of dealing with him, because he is used to a paternal form of government.

It is difficult to make our diagnosis in many of these cases. Then as soon as we have made our diagnosis, it is a pity we have not the power, by law or public opinion, to isolate our patients.

DR. DURGIN: In a case of small-pox we never take a child without its mother or sister with it if possible, and that generally constitutes all the visiting allowed in the hospital. In very few instances the mother has been allowed to come to the hospital after the child has been removed to the hospital, but is always retained until the anxiety is over, and then thoroughly disinfected and carried home. I don't think that the City Hospital trustees or the superintendent can be held to blame at all for the withdrawing of the patient. I don't understand that they have any legal right to retain them.

DR. G. H. LYMAN: I should like to ask the law on that point: if the law gives the board of health the power to isolate a small-pox case why should it not have the right to isolate a case of diphtheria?

DR. DURGIN: It has the same right.

DR. LYMAN: These patients come in by order of the board of health: ought not they to be retained until the board of health gives permission to have them removed?

DR. DURGIN: I don't understand that the board of health has control over a patient after entering the City Hospital. We have the power to start them for the hospital, but no control after they are in it, the hospital not being in charge of the board. The line where our authority begins and ceases in that case is not quite clear. I can only say that when we have left the patient in the charge of the officers of the City Hospital I don't understand that we legally have any further right, can exercise any further control over him. In our own hospital—one established and maintained by ourselves—we would have a perfect right to retain them until all danger from contact with others is passed.

DR. G. H. LYMAN: I should like to ask whether under the law the board of health must isolate all persons in any one special place: cannot the board isolate them in the City Hospital as well as anywhere else? What is the difference? Does the law state that a small-pox hospital shall be for and under the control of the board of health, or that the board of health shall have authority to isolate these cases. Suppose they choose to isolate them in a tent?

DR. DURGIN: In that event we should do precisely as we do in a dwelling house. We place our own officers there. They are our agents and have the right. We cannot make Dr. Rowe an agent of the board of health. We could go there personally if we had the right to retain a patient as in a dwelling-house or in a tent. I give an unprofessional opinion in the matter. It is purely a legal question, which I don't wish to stand in the light of a lawyer in answering.

DR. H. OSGOOD: When a patient leaves the hospital after having been confined a few days, it seems logical to suppose he is in a worse condition than when he enters, and consequently the patient is less protected than when first sent to the hospital, as we will suppose, by the board of health. I would like to ask Dr. Durgin if this society as a body could not present a memorial to any authority, either to the city or the State legislature, which will give the board of health the necessary power, and, if such a memorial would be of use, to what authority should it be presented?

DR. FOWLER suggested that the work of the committee should be directed particularly to the investigating, and to conferring with regard to diphtheria, and not take in the other contagious diseases.

DR. MARION: I have been extremely interested in the papers and the discussion which has been elicited; and I feel quite unequal to saying anything of importance upon the subject, feeling as I do, that the more I see of diphtheria the less positive I am in my opinions as to its nature and everything concerning it; so uncertain am I of late that when I see a case, with reference to

diagnosis I very often say I don't know. What seems to be a case of sore throat may be a case of diphtheria. When asked how long it will last, I tell them frankly I don't know. If the child is not better within a week I think it is very serious. In ward 25, with a population of between nine and ten thousand, during October, November, and December, there were reported to the board of health seventy-four cases, I think, a very large proportion of diphtheria it seems to me, and this has been equally distributed about the ward, not being confined to any particular locality, not confined to streets where they have sewers, to houses where they have water-closets or privies wholly, where they have used well water or water from the mains. No one marked feature has been noticed except that it has been generally distributed through the ward.

With the epidemic or endemic in Brighton, there has been a large number of cases of measles running along with it in the same family.

The matter of heart failure has been referred to. It seems to me I have noticed that phenomenon more in this epidemic than ever before. With reference to heart failure in one family not reported as diphtheria, the child, as the mother told me, was choking. Upon examination, it seemed the child had faucial paralysis with enlarged glands. All the children had had sore throats, this child included. Within a week after I first saw the child I was called again, and found three of the children down with measles. This child was with the rest, came on with the same symptoms, but instead of having a good square eruption it was very pale, the pulse hardly perceptible. The child died that night in the first stage of measles. I returned it as a death of heart failure in the initial stage of measles, heart failure from paralysis due to diphtheria. In two or three other cases of measles I have noticed heart failure.

Dr. Durgin refers to the repeated attacks of diphtheria in the same individual. In this epidemic I had a rather interesting case where a child came down with diphtheria, went through the regular stage of about ten days and recovered, and a day or two following showed the first signs of measles; the measles went through its regular course, and before the child was allowed to leave the room again a membrane developed on the fauces, and I believe it also extended into the larynx, as the child entirely lost the voice and was hoarse several days, but recovered. On the repetition of diphtheria in the child, the mother also came down with diphtheria.

Another subject that Dr. Durgin has alluded to is with reference to croup. I suppose that that is, and always will be, a disputed point. I don't know that all croup is not all diphtheria; there are some cases that certainly don't get reported as diphtheria. A case that has recently happened in the ward might illustrate what I mean. The children were all sick with measles under the care of a physician practicing sectarian medicine. This child after going through the measles was attacked with croup. The child had the operation of intubation and died within twenty-four hours; was allowed to have a public funeral, was embalmed and had a "wake." Two days after the funeral the remaining two children of the family were sent to the City Hospital by my brother. On the following day I sent the woman to take care of a child during intubation, and subsequent to that there were several cases of diphtheria, but still the first case was claimed to be a case of simon-pure croup. I fancy that oftentimes it goes that way. In connection with diphtheria it was my fortune to see several cases of diphtheria following croup; in most of these instances there was laryngeal complication, even when not coming to a fatal issue. I have an interesting case to allude to in connection with diphtheria in the puerperal state. On the 30th of November, a lady called at my office with a very severe sore throat. Being unable to make a diagnosis I gave her directions to go home and let me know if she saw anything in the throat that looked peculiar. The next night they found a very slight patch. I at once instituted the treatment for diphtheria; and the following day the fauces, soft palate, and both tonsils were covered with the characteristic exudation of diphtheria. She expected to be confined on the 5th of December. The diphtheritic process went on its regular way, and she was confined on the morning of December 5th. Everything went well. She had a very slight elevation of temperature that day; it fell back where it had been before. It did not begin excessively high—101° or 102°, and in ten days she was convalescent, and within two weeks the fauces, I think, all cleared. The child was taken immediately from the room and in another part of the house. The child was covered with an eruption of sudamina which changed to a milky appearance and disappeared. The mother did well. When the boy was 24 days old I was called to see it, as it could not breathe through its nose. I found a characteristic discharge of thin yellow serum, and felt sure it was going to be a case of nasal diphtheria. The following day a whitish membrane had formed near the anterior opening in both nares, and three or four days after that a patch of diphtheritic membrane had formed in the roof of the baby's mouth, and extended back with just a trace on one tonsil. Further than that it did not extend, and it is still under treatment. The exudation has not disappeared from the roof of the mouth as yet. It is a complication, and when it was first presented I did not know what to think or how to act. It was one of the unusual complications.

DR. MCCOLLOM, in answer to Dr. Withington's question in regard to the prevalence in the different localities of the city, presented a list of the number of cases in Boston for 1888, with the wards and relative area and the number of inhabitants: In ward one, 59 cases. That is East Boston, comprising the hill and a portion adjoining Chelsea. Population, 15,656.

Ward	1	59	15,656	Ward	14	41	22,738
"	2	16	15,700	"	15	49	16,219
"	3	16	12,328	"	16	65	16,435
"	4	28	12,518	"	17	34	14,747
"	5	26	12,827	"	18	27	14,141
(2) "	6	119	17,244 (5)	"	19	81	20,577
(6) "	7	67	12,038 (4)	"	20	85	27,983
"	8	30	11,286	"	21	40	15,620
"	9	11	11,289	"	22	49	15,834
"	10	11	9,745	"	23	38	17,424
"	11	32	17,865 (3)	"	24	110	21,500
"	12	31	13,845 (1)	"	25	141	8,523
"	13	35	22,547				

1,411 cases. 390,597-415,000.

In Dr. Marion's ward (25) 141 cases. Population 8,523. This is a rather remarkable circumstance, because we would naturally suppose that to be the healthiest portion of Boston. A very great number of the houses are isolated, more so in ward 25 than in any other portion of the city, and yet with a population of 8,524 they have had 141 cases. In all there have been reported 1,411 cases throughout the whole city during the year, and the relative frequency is, 1st ward, 25; 2d ward, 6; 3d ward, 24; 4th ward, 20; 5th ward, 19. There is very little to be learned from the other figures, because they are so nearly alike.

A good deal has been said about isolating these cases. Of course it is of importance to isolate them, but how can it be done? We have an entirely different state of affairs in diphtheria from that which exists in smallpox. In the first place we must educate the people up to the idea that diphtheria is *contagious*, and no one more fully realizes the importance or necessity of that than I do. I hear the remarks every day that diphtheria is not contagious. "If the child had smallpox or scarlet fever we would send the child to the hospital." In some cases where the parents consent to have the child go to the hospital, the family physician comes in and says: "Oh no, you had better not send her to the hospital. The child will be better in a day or two." He can't go against the family physician. No health officers, no one, can remove a patient from any house to a hospital unless the attending physician says that the patient can be removed without injury. We cannot state that there is absolutely and positively no danger. I think very few gentlemen here would care to take a posse of police officers and remove the child from its mother to the hospital, or force the mother to go. It has been done frequently in smallpox, but the community would not sustain the board of health in so doing in cases of diphtheria. It can be done by educating the people up to that point; and through the influence of the members of this Society we can accomplish a good deal.

Take the cases in Brighton. Dr. Marion has sent many cases to the hospitals and done much good. Suppose some one else had been there who did not believe diphtheria was contagious, we might have had ten times as many cases in Brighton as there have been.

Another thing, a good many of these cases are not reported until after the patient's death. It is a common thing for a patient to die, and the first report we get of the case is the death certificate. The patient may have had a physician and the physician told them the child had "sore throat," which is not reported.

It is desirable to have some place where we can send the children who are well, so that they may be watched, and the moment they come down with the disease be sent to the hospital.

As to the question of diagnosis: it is difficult in the first twenty-four hours to say absolutely, "It is diphtheria." We can advise cases to go to the hospital, but when making a forcible removal we must be *sure*. Mild cases are very apt to give rise to trouble, and the same thing is true of all contagious diseases, that the mild cases are very much more dangerous to the public health than the severe cases, because they go round everywhere and spread the disease almost indefinitely. These are some of the difficulties with which we have to contend, and for that reason I have spoken at length about them, because it is important that we take hold of the matter understandingly and see if there is not some way we can stamp out the epidemic to a certain extent.

I have seen quite a number of cases where people have had undoubted attacks of diphtheria a second and even a third time. I have in mind a case where an epidemic went through a whole family; three died and two lived, and since then there have been two attacks of unmistakable diphtheria. So far as hearsay evidence is concerned, we are constantly running across such cases. If a patient can have diphtheria three or four times we must be on our guard more than if they had the disease once in a lifetime.

DR. H. E. MARION presented the specimen of a cast of trachea which he took from a child in 1871, thinking it a case of croup.

DR. FARLOW: As an additional means of preventing the spread of diphtheria it seems to me there is something we can do toward the well children of the family. Diphtheria is a disease much more common in children than in adults. Children are subject to nasal catarrh, etc., consequently they are much more liable to the absorption of germs; so that if there is a contagious disease in the family, I think it is incumbent on the family physician to institute preventive measures, to see if there is any catarrh about the gums, or tonsils in particular, and if so, some alkaline douche should be used. Where there is a suspicion of diphtheria I think the children

should be rigorously inspected. I don't think a physician does his duty who comes into a house, gives a doubtful diagnosis, and says: "Wait two or three days," without instituting some preventive means with regard to the other children; and it seems to me that the prevention is much more important than the cure, although of course, the cure is the thing the family look for. If we can prevent the disease by keeping the throat in a healthy condition we are doing very much more than most physicians are doing now. It is what we should endeavor to accomplish.

DR. G. B. SHATTUCK: Dr. McCollom's remarks with reference to the doubtful cases represent another difficulty—that you can't send these cases to the diphtheria ward of the hospital any more than doubtful cases of small-pox to the small-pox hospital. In cases of sore throat the question comes up, "Is this patient to remain here or be transferred to the diphtheria ward?" Of course, if you send a case of tonsilitis, mild sore throat, to the hospital, and the patient develops diphtheria, it may indicate that your diagnosis is correct, or it may expose you to a suit.

DR. A. N. BLODGETT: In relation to the question of the recurrence of diphtheria I have had one or two cases sufficiently marked to convince me that recurrence of that disease is more frequent than generally supposed. I treated a case of diphtheria, in a young man 20 years of age, in which there was a moderate exudation in the throat of unmistakable character, followed by paresis of almost all the voluntary muscles, so that the limbs were powerless, speech was seriously interfered with, the patient could not move himself in bed, and was absolutely helpless for a period of two or three weeks. From this he gradually recovered, requiring no less than nine months for restoration of strength and vigor. About eighteen months afterward, he was prostrated by another distinct and unmistakable attack of diphtheria: the pharyngeal exudation was distinct and unmistakable, but there was no affection of the nervous system of the kind which occurred from the first case. The two attacks were treated by careful isolation, disinfection, the use of bichloride of mercury, and tincture of the chloride of iron, together with strychnine and other tonics. The patient recovered:

DR. A. L. MASON, in closing the discussion, said: In making these informal remarks about diphtheria I did not wish to convey the impression that the mortality rate seemed to me excessive in the City Hospital. It seems to me the wards are doing their work very well, and I should think would tend to diminish the amount of grave diphtheria that exists in the city. The object of a resolution of this kind is to aid the Board of Health in all its efforts. I am sure all of us are obliged to Dr. Durgin, Dr. McCullom and Dr. Marion for coming this evening and giving us so much valuable information with regard to the course of this epidemic.

Of course the mortality rate at the City Hospital is made much larger from the number of moribund cases which enter; but the rate of mortality cannot be regarded as excessively high, I think, as compared with statistics from other countries.

DR. LYMAN then presented the following resolution, which was read by the Secretary:

Resolved: That a committee of three be appointed by the Chair to confer with the Board of Health as to the desirability of further measures to limit the spread of diphtheria in Boston. The resolution was adopted.

The Chair appointed Drs. G. H. Lyman, G. B. Shattuck, C. F. Folsom, as that committee.

FOREIGN CORRESPONDENCE.

LETTER FROM PARIS.

(FROM OUR OWN CORRESPONDENT.)

THE PARIS SCHOOL OF MEDICINE. II.

There is only one university in France, one degree, that of Doctor of Medicine, which is conferred by various faculties already named. There is one system of hospitals, all alike open to the student for his one fee. The degrees of Doctor of Surgery and Doctor of Medical Science, may be considered practically obsolete, as one thinks of taking them. Medical teaching in Paris may be divided under the heads of the theoretical teaching given at the Schools of Medicine, and of the hospital teaching which comprehends clinical courses associated with clinical experience. The immense majority of French and foreign students in Paris follow both the official courses of the Faculty and the gratuitous courses given by the physicians or surgeons of the hospitals and unattached teachers. In his third year every student is obliged to attend the hospital regularly, as "stugiaire," or "externe," or "interne." The stugiaires are students following their curriculum, and are divided among the different series of services, medicine, surgery, and midwifery, according to their choice, and must follow the visits of the medical officers during two years, with power to pass from one hospital to the other, but under the obligation to furnish certificates of attendance at the hospitals during 300 days in each year. Students who desire to undertake hospital studies apart from the obligatory curriculum, can attend any of the hospitals under the title of "bénévoles," that is to say, they are not called upon to pay any fee, and they can attend at their pleasure. This privilege is enormously valuable to foreign students. Foreigners are admitted to competition for the "internat" and the "externat." The office of externe or interne can only be obtained

by competitive examinations, and that of interne lasts for four years, and is the stepping-stone to further higher nominations, such as Chefs de Service, and hospital physicians or surgeons. The medical cliniques of the Faculty are four in number. For clinical medicine we have Professors Germain Sée at the Hôtel Dieu, Jaccoud at the Pitié, Potain at the Charité, and Peter at the Necker Hospital. For clinical surgery, we have Professors Richet at the Hôtel Dieu, Verneuil at the Pitié, Trélat at the Charité, and Le Fort at the Necker. Besides these official cliniques there are a certain number of physicians and surgeons in the hospitals whose voluntary courses are followed. Among these may be mentioned those of Drs. Tillaux at the Hôtel Dieu, Péan at Saint Louis, Labbé at Beaujon, in surgery; and in therapeutics, those of Drs. Dujardin-Beaumetz at Cochin, Huchard at Bichat, and Jules Simon at the Hôpital des Enfants Malades. Foreign students and practitioners who come to Paris to supplement or complete their studies, the whole of the resources of the Faculty of Paris and that of the hospitals are open to them, and those who wish to give themselves up to some specialty have ample opportunities for doing so. Those who wish to study the diseases of the skin will find at the Hôpital Saint Louis unrivalled material. The official course is delivered by Dr. Tourmer, the celebrated syphilographer. For nervous diseases we have Professor Charcot at Salpétrierè, for mental disease, the official course of Professor Ball and the clinique of Dr. Magnan at the Saint Anne Asylum. For diseases of the eyes there is the official clinique of Professor Panas at the Hôtel Dieu. There are a great number of cliniques carried on by unattached medical men, who do not form part of the medical corps of the hospitals which the students can follow without being required to pay any fee. These are conducted by Drs. Landolt, Galezowski, and de Wecker, for ophthalmological study, which is also treated of at the hospitals of the Quinze-Vingts. In the study of pathological anatomy may be noted the necropsies of the clinical service of Professor Germain Sée, which are performed at the Hôtel Dieu by Professor Cornil. The teaching of legal medicine, from a theoretical point of view, is carried on at the Faculty, while the practical part of the same branch is carried on at the morgue, both under the direction of Dr. Brouardel, Professor of Forensic Medicine, and Dean of the Faculty. Venereal diseases are especially studied at the Hôpital du Mide for men, and at Lourcine for women. For diseases of the throat there are special consultations held at the Lariboisierè by Dr. Gougenheim. For diseases of the ear there are the institutions for the deaf and dumb, at the consultations of which all foreign students are admitted. For accouchments the Clinique of the Faculty, and the maternités of the hospitals, directed by Professor Tarnier at the former, Drs. Budin and Pinard at the Lariboisierè and the Charité, respectively. One of the most important special cliniques is that conducted by Professor Guyon, at the Necker Hospital, for diseases of the urinary organs. All foreign practitioners or students can attend without payment all the cliniques and all the visits of the Professors, and obtain all the information that they desire. They can also by moderate payments obtain private courses of lessons, either from the Internes or from the Chefs de Clinique, at their evening visits at the hospitals. The extensive and important laboratories of MM. Ranvier, Brown-Sèquard, Marey, Dastre, etc., at the College of France, are also open to all native and foreign students. Candidates for the office of physician, surgeon, or obstetric officer at the hospitals, are admitted to "concours" on producing evidence of being natives of France, or naturalized, and of having had the degree of Doctor of Medicine for two years, at least. They have to undergo a written and oral examination on the various branches of medicine and surgery. The post of Assistant Professor, or Agrigi, is also filled up after competitive examination.

Dr. Legouest, the well-known military surgeon, died on the 5th inst., at his residence in Paris, in the 69th year of his age. He was Inspector-General of hospitals, and former President of the Council of Health of the Army. He was also Professor of clinical surgery at Val-de-Grâce, and was raised to the dignity of Commander of the Legion of Honor in recognition of his valuable services. He was a member of the Academy of the Medicine since 1867, in the Section of Surgical Pathology. He was President of the Academy in 1881. He was the author of several important works, of which the following may be selected from among them. Besides his thesis for the doctorate in 1845, he published a memoir entitled: Kystes synoviaux du poignet, in 1857; La Chirurgie Militaire Contemporaine, in 1859; Une Conférence sur le service de Santé, in campagne 1868; Le Service de Santé des Armées Americaines pendant la guerre des Etats Unis de 1861 à 1866; Étude sur la salubrité des hôpitaux militaires de Paris, in 1864; Traité de Chirurgie d'Armée, in 1872.

A. B.

DOMESTIC CORRESPONDENCE.

LETTER FROM CINCINNATI.

(FROM OUR OWN CORRESPONDENT.)

Commencement Exercises at the Medical and Dental Colleges—Cincinnati Academy of Medicine.

The Cincinnati College of Pharmacy held its seventeenth annual Commencement at Musik Verein Hall on the evening of March 14. After the exercises the usual banquet was given. There

were eighteen graduates from the College of Pharmacy this year.

The Commencement exercises of the Cincinnati College of Medicine and Surgery were held in the Scottish Rite Cathedral February 26, where they graduated thirty-two Doctors of Medicine. This is the largest class to leave this institution for some years. Dr. R. C. Stockton Reed made the address of the Dean, and the valedictory address was given by Dr. C. A. L. Reed.

The Commencement of the Ohio College of Dental Surgery was largely attended at College Hall on the evening of March 4. Sixty-five Doctors of Dental Surgery were graduated. The address was made and degrees conferred by Dr. C. R. Taft, as Dr. George W. Keeley, President of the Board of Trustees, had died within the last year. The address to the students was delivered by Mr. E. D. Warfield, the oration by H. M. Paxton. Prof. H. A. Smith, Dean of the Faculty, awarded the prizes, and the exercises were followed by a banquet at the Burnet House for the graduates, faculty and alumni.

The Miami Medical College, at its Commencement at the Odeon the evening of the 6th of March, graduated a class of twenty-two. The remarks by the Dean, Dr. Wm. H. Taylor, were followed by an address from Hon. W. H. McGuffey, President of the Board of Trustees. The valedictory address was delivered by Dr. Byron Stanton, Professor of Gynecology. Dr. Stanton discussed the care of the public health, which field is in his line as Health Officer of the city. The Faculty Prize, $100 in gold, was awarded Dr. H. E. McVey, of Mt. Blanchard, O. The largest and most enthusiastic meeting of the alumni for some time was held at the Burnet House, where a very enjoyable banquet was given. The Association elected as President, Dr. L. M. Buchwalter; Secretary, Dr. J. C. Oliver. The retiring President, Dr. W. C. Chapman, of Toledo, made a very interesting valedictory address. Dr. Dan. Millikin, of Hamilton, was an excellent toastmaster, and the responses to the various toasts were made in the happiest vein. Two members of the Association were expelled for advertising.

At the seventieth annual Commencement of the Medical College of Ohio eighty-six Doctors of Medicine were graduated. This was held in the Odeon March 7. Dr. W. W. Seely made some short, pointed remarks as Dean of the Faculty. He was followed by the address of the President of the Board of Trustees, Hon. Wm. H. Dickson, who delivered the diplomas. This speaker paid his respects to the neglect of the duties of the politician by physicians. His interesting address urged more attention to the affairs of the country by doctors and the assumption of an active part therein. The Faculty Prize for the best final examination in all departments was captured by Dr. Erwin O. Straehley, of Cincinnati. Dr. Forcheimer, Professor of Physiology and Diseases of Children, delivered the valedictory address, advocating his subject, "Specialism in Medicine," with many good arguments.

The alumni of the Medical College of Ohio met at Memorial Hall the afternoon of March 7. An address was made by the President, Dr. S. J. Spees, of Hillsboro, Ohio. "Politics and the Doctor" was the subject of the annual address, delivered by Dr. Miles F. Porter, of Fort Wayne, Ind. The matter of the publication of the early history of the College from 1819 to the present was placed in the hands of a committee.

At a recent meeting of the Academy a report was made by a gentleman on the radical cure of hernia. His paper was very able and was listened to with close attention. At the end he wished to show three male patients on whom he had operated successfully. Two lady members of the Academy were present and the men positively refused to exhibit unless the ladies absented themselves. The President descended from his chair and asked the ladies to be kind enough to retire, which they did. The patients then took their stand on the rostrum and were inspected by all present who wished to do so. At the next meeting one of the ladies, having taken offense at being deprived of her inalienable rights, immediately after the reading of the minutes demanded an explanation of why she had been excluded from a part of the previous meeting. The President tried to satisfy the lady M.D. with an evasive answer which was rendered all the more transparent by the diffidence with which it was given. The lady asked with renewed emphasis why she was requested to withdraw, and still remained unsatisfied when the President told her that the men refused to exhibit themselves unless the ladies were absent. MC. K.

Commencement Exercises of the Chicago Medical College, Medical Department of the Northwestern University.

Mr. Editor:—While attending the Thirtieth Annual Commencement Exercises of the abovenamed college, on the 26th of March, 1889, I noted the following items that will be of more or less interest to your readers in all parts of the country. The college was organized on the basis of a strictly graded system of medical education, and requires a fair standard of preliminary education for admission, three full years of medical study, including three annual courses of medical college instruction of not less than six months each, with laboratory and hospital clinical attendance two college courses. During the college year just closed the classes in attendance numbered as follows: 1st year class 79; 2d year class 52; 3d year class 51; making a total of 182.

After music, and the opening prayer by Rev.

Joseph Cummings, D.D., L.L.D., President of the University, the Dean of the medical faculty announced the awarding of the following prizes:

The Fowler Prize, being a case of test lenses worth $100, given by E. S. & W. S. Fowler, of Chicago, to that student of the Chicago Medical College who at the close of this session shows the most proficiency in theoretical and practical optics, was awarded, after careful examination, to Carleton Montville Balfour, of Kansas.

The Fuller Prize, of $25, for the best graduating thesis on Puerperal Fever was divided. Of the competitors two show such equal merit that the committee concluded to divide the prize and give one-half to Abraham Lincoln Blesh, of Kansas, and one-half to E. J. Boeseke, of California.

A prize, consisting of a case of amputating instruments, offered by Dr. A. J. Coey to the member of the Clinical Class in Mercy Hospital who should write the best thesis on the Differential Diagnosis of Injuries of the Hip-joint, was awarded by the proper committee to E. J. Boeseke, of California.

The Faculty Prize for the best thesis has been awarded to the author of the thesis on the "Etiology, Pathology and Treatment of Thermic Fever," Francis William McNamara, of Illinois. This thesis is not only well written but it also contains the results of some important original investigations. The theses of Pierrepont Isham Prentice, George William Harkins, Daniel Webster Eiss, and James Perry Houston, are also worthy of special commendation.

Ingals Prize.—Two years since, Dr. Ephraim Ingals, well known as one of the older and most highly esteemed physicians of this city, wishing to encourage a higher standard of general education and mental discipline for students of medicine, instituted a prize of $100, to be awarded to the member of the graduating class in this College who should attain the highest average standing in literature, science and medicine; the same to be determined by a committee of the medical faculty. One year since, in furtherance of the same object, Dr. Geo. Wheeler Jones, of Danville, Ill., offered a prize of $50, to be awarded to the member of the graduating class of 1889 who attained the second position in the contest for the Ingals prize. The committee having charge of the examination for these prizes required the same to be conducted in writing, and to include, under the head of *Literature*, English composition, rhetoric, logic, history, and English literature; under *Science*, algebra, physics, botany, natural history, and the topography and geology of the United States; and under *Medicine*, all the branches of medicine and surgery included in the curriculum of the medical college. All who entered the contest were graduates of literary colleges or universities, some in the East and some in the West. After careful comparison of the results of the examination the committee unanimously awarded the Ingals Prize of $100 to James Perry Houston, of Ohio, and the Jones Prize of $50 to Leonard Lawshe Skelton, of Illinois,

In formally presenting the graduating class to the President of the University for the degree of Doctor of Medicine, the Dean of the medical faculty gave the following interesting items of their collegiate history:

The class entered the College as first year students in 1886, numbering 53, and were examined at the close of that college year in all the branches of the first year course. Only 37 of the number returned for the second year course, 16 having been lost; but 10 new students coming from other colleges were admitted by examination for advanced standing, making the number for the second year 47. Of this number 43 returned for the third year course, 4 only having been lost. To these 8 who had spent two years in other medical colleges were admitted by examination for advanced standing, making the whole number in the third year class 51. Of these 46 were presented by the President of the University, as having complied with all the requirements of the College and passed satisfactorily all examinations, for the degree of Doctor of Medicine. Of this number 18, or a fraction less than 40 per cent., were regular graduates of literary and scientific colleges, and the remaining 28 had pursued academic and collegiate studies from one to five years before commencing the study of medicine.

The whole number of matriculates in the College this year being 182, it will be seen that the ratio of graduates to matriculates is only a fraction over 25 per cent. Such is the result of a rigidly graded and faithfully executed three years course of medical studies. S. M.

MISCELLANY.

STATE MEDICAL SOCIETY OF TENNESSEE.—This Society will meet in annual session at Nashville, April 30, and continue in session three days. Tickets to Nashville can be bought at that time in all the Southern States at one fare for the round trip, good for ten or more days. G. C. Savage, M.D., Chairman Com. of Arrangements.

SEVENTH DECENNIAL CONVENTION FOR REVISING THE PHARMACOPŒIA OF THE UNITED STATES OF AMERICA.—Notice is hereby given that, in accordance with and by virtue of the authority vested in me by the Convention of 1880, I hereby call upon the several incorporated Medical Societies, incorporated Medical Colleges, incorporated Colleges of Pharmacy, and incorporated Pharmaceutical Societies throughout the United States of America, the American Medical Association, and the American Pharmaceutical Association, to elect a number of delegates, not exceeding *three*, and upon the Surgeon-General of the Army, Surgeon-General of the Navy, and the Surgeon-General of the Marine-Hospital Service, to appoint, each, not exceeding *three* medical officers to at-

tend a General Convention for the Revision and Publication of the Pharmacopœia of the United States of America, to assemble in the city of Washington, D. C., on the first Wednesday of May, 1890 (May 7th), at twelve o'clock noon.

The several bodies, as well as the Medical Departments of the Army, Navy, and Marine-Hospital Service, are hereby requested to submit the Pharmacopœia to a careful revision and to transmit the result of their labors to the Committee of Revision at least three months before the meeting of the General Convention.

The several medical and pharmaceutical bodies are hereby requested to transmit to me, as the President of the Convention of 1880, the names and residences of their respective delegates, as soon as they shall have been appointed; a list of these delegates shall thereupon be published under my authority, for the information of the medical public, in the newspapers and medical journals in the month of March, 1890.

In the event of the death, resignation or inability of the President of the Convention of 1880 to act, these duties (in accordance with the resolution of that Convention) shall devolve, successively, in the following order of precedence: upon the Vice-Presidents, the Secretary, the Asst. Secretary, and the Chairman of the Committee of Revision and Publication of the Pharmacopœia.

These officers are as follows: First Vice-President, Samuel C. Busey, M.D., of Washington, D. C.; Second Vice-President, P. W. Bedford, Ph.G., of New York; Secretary, Frederick A. Castle, M.D., of New York; Assistant Secretary, C. H. A. Kleinschmidt, M.D., of Washinton, D. C.; Chairman of Committee of Revision, Charles Rice, Ph.D., of New York; First Vice-Chairman of the Committee of Revision, Joseph P. Remington, Ph.D., of Philadelphia, Pa.; Second Vice-Chairman of the Committee of Revision, C. Lewis Diehl, Ph.G., of Louisville, Ky.

At the General Convention held in Washington, D. C., on the fifth day of May, 1880, the organizations and bodies enumerated in the Abstract of the Proceedings of the National Convention of 1880, on pp. xv. to xviii of the U. S. Pharmacopœia of 1882—a list of which will be found appended to this call—were recognized as being entitled to representation.

If any body other than those admitted in 1880 shall desire a representation in the Convention of 1890, it is suggested that the proof of incorporation, signed by the Secretary of State, of the State which shall have issued the charter, or by properly qualified public officials of the United States, be presented with the credentials of the delegation

A blank form of certificate of appointment of delegates will be sent upon application by letter to my address, care of Dr. Edwin H. Brigham, Assistant Librarian of the Boston Medical Library, 19 Boylston Place, Boston, Mass. (Signed)

ROBERT AMORY, Pres't of the Convention of 1880.
Boston, March 9, 1889.

LETTERS RECEIVED.

Dr. John P. Stoddard, Muskegon, Mich.; Dr. Wm. B. Canfield, Baltimore, Md.; Dr. J. H. Fiegenbaum, Alton, Ill.; J. J. Kindred, Louisville, Ky.; Dr. J. T. Cron, Carrollton, Ill.; E. W. Woodruff, Black Lick, O.; Parke, Davis & Co., Detroit, Mich.; Dr. G. C. Savage, Nashville, Tenn.; Dr. A. L. Hummel, Philadelphia; Dr. Willis P. King, Kansas City, Mo.; Dr. John I. Miller, Wellston, Mo.; Dr. Leonard St. John, Chicago; Plimpton Mfg. Co., Hartford, Conn.; I. Haldenstein, New York; New York & Chicago Chemical Co., New York; Thos. Leeming & Co., New York; American Advertising Agency, Cincinnati, O.; Dr. Russell Bayly, New York; Dr. Willard Streetman, Sweetwater, Tex.; Dr. M. W. White, Sioux City, Ia.; Miss Maggie Kennedy, Carterville, Illinois; Eisner & Mendelson Co., New York; A. E. Walesby, O. Stubville, Louisville, Ky.; J. Walter Thompson, New York; Clark Bell, New York; Dr. E. Fletcher Ingals, Chicago; Dr. R. J. Dunglison, Philadelphia; J. S. Dorsey, Baltimore, Md.; F. T. McFadden, New York; Longmans, Green & Co., New York; Dr. S. B. W. McLeod, New York; Walter Baker & Co., Boston; Boston Gynecological Society; Cincinnati Polyclinic; Dr. Hamline, Marysville, Cal.; A. M. McLaurie, New York; Ward Bros., Jacksonville, Ill.; Dr. J. W. Park, Williamstown, Pa.; Dr. Charles F. Disen, Seattle, W. T.; J. B. Imhoff, Chester, Pa.; Dr. W. H. Keller, Jersey City, N. J.; Dr. Emil Pfeiffer, Wiesbaden; M. Goltman, Montreal, Can.; Thos. S. Blair, Ann Arbor, Mich.; Dr. G. W. Galloway, Findlay, O.; D. Kimball, Chicago; Nugent, Brown & Co., Fargo, Dak.; Provident Chemical Works, St. Louis; Lambert Pharmacal Co., St. Louis; Wm. Burnett, Montreal, Can.; Dr. Moreau R. Brown, Chicago; Eisner & Mendelson Co., New York; J. H. Basinger, Louisvlle, Ky.; L. Victoria Hampton, Portland, Oregon; Union Pacific Railway Co., Omaha, Neb.; Dr. Richard J. Dunglison, Philadelphia; Henry Bernd & Co., St. Louis; Dr. H. B. Ransom, Chicago; New York Pharmaceutical Co., Bedford Springs, Mass.; Dr. L. Duncan Bulkley, New York; James Pyle & Sons, New York; Dr. G.W. Hubbard, Nashville, Tenn.; Dr. P. R. Burns, Nashville, Tenn.; Dr. J. S. Cameron, Wichita, Kan.; Dr. S. W. Crosthwaite, Nashville, Tenn.; Dr. J. W. Dickson, Orangeburg, S. C.; Dr. J. F. Dyson, Nashville, Tenn.; Dr. O. W. James, Chattanooga, Tenn.; Dr. J. J. Masy, Paducah, Ky.; Dr. C. McCarthy, Macon, Ga.; Dr. G. Phipps, Nashville, Tenn.; Dr. H. L. Phipps, Navassota, Tex.; Dr. J. M. Thompson, Birmingham, Ala.; Dr. R. S. White, Nashville, Tenn.; P. W. Garfield, Cleveland, O.; Rio Chemical Co., St. Louis; J. Walter Thompson, New York; E. A Smith, Burlington, Vt.; Dr. A. E. Baldwin, Chicago; Dr. N. S. Craig, Brookhaven, Miss.; Wm. J. Dornan, Philadelphia; W. B. Clark, Baltimore, Md.; Dr. J. A. Robison, Chicago; Dr. W. C. Coombs, Wichita, Kan.; E. Merk, New York.

Official List of Changes in the Stations and Duties of Officers Serving in the Medical Department, U. S. Army, from March 23, 1889, to March 29, 1889.

Asst. Surgeon Richards Barnett, U. S. Army, died March 27, 1889, at Ft. Riley, Kan.

Capt. Louis M. Maus, Asst. Surgeon (Ft. Schuyler, N. Y. H.) will proceed to Camp S. B. Luce, Fisher's Island, N. Y., with battery "K," 5 U. S. Artillery, and report to the camp commander for a tour of rifle practice. Par. 10, S. O. 158, Hdqrs. Div. of the Atlantic, Governor's Island, New York City, August 2, 1889.

Altanta Bks., Ga. Established by G. O. 28, A. G. O., March 21, 1889.

Official List of Changes in the Medical Corps of the U. S. Navy for the Week Ending March 30, 1889.

Asst. Surgeon Thos. A. Berryhill, detached from Naval Academy, Annapolis, Md., and to the Naval Hospital, New York.

P. A. Surgeon A. C. Heffenger, ordered to appear before the retiring board, Washington, D. C.

Official List of Changes of Stations and Duties of Medical Officers of the U. S. Marine-Hospital Service, for the Four Weeks Ending March 23, 1889.

Asst. Surgeon G. M. Magruder, to report to the Supervising Surgeon-General in person for temporary duty. March 1 and 23, 1889.

Asst. Surgeon J. J. Kinyoun, relieved from duty at Baltimore, Md., to rejoin station at New York, N. Y., March 18, 1889.

Asst. Surgeon J. C. Perry, commissioned by the President, March 21, 1889. Ordered to Marine Hospital, Mobile, Ala., for temporary duty. March 22, 1889.

Asst. Surgeon A. C. Smith, commissioned by the President, March 21, 1889. Ordered to Marine Hospital, Louisville, Ky. March 22, 1889. Temporary duty.